### AMIDSTtoolbox

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## **Contents**

1	Nam	nespace Index	1
	1.1	Packages	1
2	Hier	rarchical Index	3
	2.1	Class Hierarchy	3
3	Clas	ss Index	5
	3.1	Class List	5
4	Nam	nespace Documentation	7
	4.1	Package eu.amidst.core.database	7
		4.1.1 Detailed Description	7
	4.2	Package eu.amidst.core.database.filereaders	7
		4.2.1 Detailed Description	8
	4.3	Package eu.amidst.core.distribution	8
		4.3.1 Detailed Description	8
	4.4	Package eu.amidst.core.exponentialfamily	9
		4.4.1 Detailed Description	9
	4.5	Package eu.amidst.core.variables	9
		4.5.1 Detailed Description	10
5	Clas	ss Documentation	11
	5.1	eu.amidst.core.database.filereaders.arffFileReader.ArffDataStream Class Reference	11
		5.1.1 Detailed Description	11
	5.2	eu.amidst.core.database.filereaders.arffFileReader.ArffParserException Class Reference	11
		5.2.1 Detailed Description	11
	5.3	eu.amidst.core.utils.ArrayVector Class Reference	12
		5.3.1 Detailed Description	12
	5.4	eu.amidst.core.variables.Assignment Class Reference	12
		5.4.1 Detailed Description	12
	5.5	eu.amidst.core.database.Attribute Class Reference	12
		5.5.1 Detailed Description	13
	5.6	eu amidst core database Attributes Class Reference	13

iv CONTENTS

	5.6.1 I	Detailed Description	13
5.7	eu.amids	st.core.modelstructure.BayesianNetwork Class Reference	13
	5.7.1 I	Detailed Description	14
5.8	eu.amids	st.core.database.dynamics.BucketSequenceData Interface Reference	14
	5.8.1 I	Detailed Description	14
5.9	eu.amids	st.core.database.dynamics.BucketSequenceStream Interface Reference	14
	5.9.1 I	Detailed Description	14
5.10	eu.amids	st.staticmodelling.models.Classifier Interface Reference	15
	5.10.1 I	Detailed Description	15
5.11	eu.amids	st.core.distribution.ConditionalDistribution Class Reference	15
	5.11.1	Detailed Description	15
	5.11.2	Member Function Documentation	16
	!	5.11.2.1 getConditionalProbability	16
	!	5.11.2.2 getConditioningVariables	17
	!	5.11.2.3 getLogConditionalProbability	17
	5.11.3 I	Member Data Documentation	17
	!	5.11.3.1 parents	17
5.12	eu.amids	st.core.potential.ConstantPotential Class Reference	17
	5.12.1	Detailed Description	18
5.13	eu.amids	st.core.huginlink.ConverterToAMIDST Class Reference	18
	5.13.1 I	Detailed Description	18
5.14	eu.amids	st.core.huginlink.ConverterToHugin Class Reference	18
5.15	eu.amids	st.core.modelstructure.DAG Class Reference	18
	5.15.1	Detailed Description	19
5.16	eu.amids	st.core.database.filereaders.DataFileReader Interface Reference	19
	5.16.1 I	Detailed Description	19
5.17	eu.amids	st.core.database.DataInstance Interface Reference	19
	5.17.1	Detailed Description	20
5.18	eu.amids	st.core.database.DataOnDisk Interface Reference	20
	5.18.1	Detailed Description	20
5.19	eu.amids	st.core.database.DataOnMemory Interface Reference	20
	5.19.1 l	Detailed Description	20
5.20	eu.amids	st.core.database.DataOnStream Interface Reference	21
	5.20.1	Detailed Description	21
5.21	eu.amids	st.core.database.filereaders.DataRow Interface Reference	21
	5.21.1	Detailed Description	21
5.22	eu.amids	st.core.database.filereaders.DataRowMissing Class Reference	21
	5.22.1	Detailed Description	22
5.23	eu.amids	st.core.database.filereaders.arffWekaReader.DataRowWeka Class Reference	22
	5.23.1 I	Detailed Description	22

CONTENTS

5.24	eu.amidst.core.distribution.Distribution Class Reference	22
	5.24.1 Detailed Description	23
	5.24.2 Member Function Documentation	23
	5.24.2.1 getVariable	23
	5.24.3 Member Data Documentation	23
	5.24.3.1 var	23
5.25	eu.amidst.core.distribution.DistributionBuilder Class Reference	23
	5.25.1 Detailed Description	23
5.26	eu.amidst.core.variables.DistType Enum Reference	23
	5.26.1 Detailed Description	24
5.27	eu.amidst.core.database.filereaders.arffFileReader.DrillingAttributes Class Reference	24
	5.27.1 Detailed Description	24
5.28	eu.amidst.core.modelstructure.DynamicBayesianNetwork Class Reference	24
	5.28.1 Detailed Description	25
	5.28.2 Member Function Documentation	25
	5.28.2.1 initializeDistributions	25
	5.28.2.2 newDynamicBayesianNetwork	25
5.29	eu.amidst.core.database.filereaders.DynamicDataInstance Class Reference	25
	5.29.1 Detailed Description	26
5.30	eu.amidst.core.database.filereaders.DynamicDataOnDiskFromFile Class Reference	26
	5.30.1 Detailed Description	26
	5.30.2 Constructor & Destructor Documentation	26
	5.30.2.1 DynamicDataOnDiskFromFile	26
5.31	eu.amidst.core.database.filereaders.DynamicDataOnMemoryFromFile Class Reference	27
	5.31.1 Detailed Description	27
5.32	eu.amidst.core.variables.DynamicVariables Class Reference	27
	5.32.1 Detailed Description	27
	5.32.2 Constructor & Destructor Documentation	28
	5.32.2.1 DynamicVariables	28
5.33	eu.amidst.core.exponentialfamily.EF_BaseDistribution_MultinomialParents< E extends EF_ Distribution > Class Reference	20
E 0.4		28
	eu.amidst.core.exponentialfamily.EF_ConditionalDistribution Class Reference	28
5.35	eu.amidst.core.exponentialfamily.EF_Distribution Class Reference	29
	5.35.2 Member Function Documentation	30
		30
	5.35.2.1 getVariable	30
	5.35.3 Member Data Documentation	30
E 26		30
5.36	eu.amidst.core.exponentialfamily.EF_DistributionBuilder Class Reference	30
	5.36.1 Detailed Description	30

vi CONTENTS

5.37	eu.ami	dst.core.exponentialfamily.EF_Multinomial Class Reference	30
	5.37.1	Detailed Description	31
	5.37.2	Constructor & Destructor Documentation	31
		5.37.2.1 EF_Multinomial	31
5.38	eu.ami	dst.core.exponentialfamily.EF_Normal Class Reference	31
	5.38.1	Detailed Description	32
5.39	eu.ami	dst.core.exponentialfamily.EF_UnivariateDistribution Class Reference	32
	5.39.1	Detailed Description	33
5.40	eu.ami	dst.core.database.filereaders.arffFileReader.Keys Class Reference	33
	5.40.1	Detailed Description	33
5.41	eu.ami	dst.Main Class Reference	33
5.42	eu.ami	dst.core.exponentialfamily.MomentParameters Class Reference	33
	5.42.1	Detailed Description	34
5.43	eu.ami	dst.core.distribution.Multinomial Class Reference	34
	5.43.1	Detailed Description	34
	5.43.2	Constructor & Destructor Documentation	34
		5.43.2.1 Multinomial	34
	5.43.3	Member Function Documentation	35
		5.43.3.1 getLogProbability	35
		5.43.3.2 getProbabilities	35
		5.43.3.3 getProbabilityOfState	35
		5.43.3.4 setProbabilities	35
		5.43.3.5 setProbabilityOfState	35
5.44	eu.ami	dst.core.distribution.Multinomial_MultinomialParents Class Reference	36
	5.44.1	Detailed Description	36
	5.44.2	Constructor & Destructor Documentation	36
		5.44.2.1 Multinomial_MultinomialParents	36
	5.44.3	Member Function Documentation	37
		5.44.3.1 getLogConditionalProbability	37
		5.44.3.2 getMultinomial	37
		5.44.3.3 setMultinomial	37
		5.44.3.4 setMultinomial	37
5.45	eu.ami	dst.core.utils.MultinomialIndex Class Reference	38
	5.45.1	Detailed Description	38
	5.45.2	Member Function Documentation	38
		5.45.2.1 getIndexFromVariableAssignment	38
		5.45.2.2 getIndexFromVariableAssignment	40
		5.45.2.3 getIndexFromVariableAssignment	40
		5.45.2.4 getNumberOfPossibleAssignments	40
		5.45.2.5 getVariableAssignmentFromIndex	40

CONTENTS vii

5.46	eu.amic	st.core.potential.MultivariateGaussian Class Reference	41
	5.46.1	Detailed Description	41
5.47	eu.amic	st.core.potential.MultivariateGaussianCF Class Reference	41
	5.47.1	Detailed Description	42
5.48	eu.amic	st.core.exponentialfamily.NaturalParameters Class Reference	42
	5.48.1	Detailed Description	42
5.49	eu.amic	st.core.database.filereaders.NextDynamicDataInstance Class Reference	42
	5.49.1	Detailed Description	42
5.50	eu.amic	st.core.distribution.Normal Class Reference	43
	5.50.1	Detailed Description	43
	5.50.2	Constructor & Destructor Documentation	43
		5.50.2.1 Normal	43
	5.50.3	Member Function Documentation	44
		5.50.3.1 getLogProbability	44
		5.50.3.2 getMean	44
		5.50.3.3 getProbability	44
		5.50.3.4 getSd	44
		5.50.3.5 setMean	44
		5.50.3.6 setSd	45
5.51	eu.amio	st.core.distribution.Normal_MultinomialNormalParents Class Reference	45
	5.51.1	Detailed Description	45
	5.51.2	Constructor & Destructor Documentation	46
		5.51.2.1 Normal_MultinomialNormalParents	46
	5.51.3	Member Function Documentation	46
		5.51.3.1 getLogConditionalProbability	46
		5.51.3.2 getNormal_NormalParentsDistribution	46
		5.51.3.3 setNormal_NormalParentsDistribution	46
		5.51.3.4 setNormal_NormalParentsDistribution	47
5.52	eu.amid	st.core.distribution.Normal_MultinomialParents Class Reference	47
	5.52.1	Detailed Description	47
	5.52.2	Constructor & Destructor Documentation	48
		5.52.2.1 Normal_MultinomialParents	48
	5.52.3	Member Function Documentation	48
		5.52.3.1 getLogConditionalProbability	48
		5.52.3.2 getNormal	48
		5.52.3.3 setNormal	48
		5.52.3.4 setNormal	49
5.53	eu.amic	st.core.distribution.Normal_NormalParents Class Reference	49
	5.53.1	Detailed Description	49
	5.53.2	Constructor & Destructor Documentation	50

viii CONTENTS

		5.53.2.1 Normal_NormalParents	50
	5.53.3	Member Function Documentation	50
		5.53.3.1 getCoeffParents	50
		5.53.3.2 getIntercept	50
		5.53.3.3 getLogConditionalProbability	50
		5.53.3.4 getSd	51
		5.53.3.5 getUnivariateNormal	51
		5.53.3.6 setCoeffParents	51
		5.53.3.7 setIntercept	51
		5.53.3.8 setSd	51
5.54	eu.ami	dst.core.huginlink.Others Class Reference	51
	5.54.1	Detailed Description	51
5.55	eu.ami	dst.core.modelstructure.ParentSet Class Reference	52
	5.55.1	Detailed Description	52
	5.55.2	Member Function Documentation	52
		5.55.2.1 blockParents	52
5.56		dst.core.potential.Potential Interface Reference	52
		Detailed Description	52
5.57		dst.core.potential.PotentialFunctional Class Reference	53
		Detailed Description	53
5.58		dst.core.potential.PotentialTable Class Reference	53
		Detailed Description	53
5.59		dst.core.database.dynamics.SequenceDataStream Interface Reference	54
<b>5.00</b>		Detailed Description	54
5.60		dst.core.database.dynamics.readers.SequenceDataStreamReaderFromFile Class Reference	54
E 01		Detailed Description	54
5.61		dst.core.database.dynamics.SequenceStreamWindow Interface Reference	54
E 60		Detailed Description	55 55
3.02		Detailed Description	55 55
5.63		dst.core.database.filereaders.StaticDataInstance Class Reference	55
0.00		Detailed Description	55
5.64		dst.core.database.filereaders.StaticDataOnDiskFromFile Class Reference	56
		Detailed Description	56
5.65		dst.core.database.filereaders.StaticDataOnMemoryFromFile Class Reference	56
2.33		Detailed Description	56
5.66		dst.core.variables.StaticVariables Class Reference	57
		Detailed Description	57
		Constructor & Destructor Documentation	57
		5.66.2.1 StaticVariables	57

CONTENTS

		5.66.2.2	StaticVarial	oles													57
5.67	eu.ami	dst.core.ex	ponentialfar	nily.Suffic	ientStatis	tics Cla	ss Re	ferer	ice								57
	5.67.1	Detailed [	Description														58
5.68	eu.ami	dst.core.dis	stribution.Un	ivariateD	istribution	Class	Refere	ence									58
	5.68.1	Detailed [	Description														58
	5.68.2	Member F	Function Do	cumentati	on												58
		5.68.2.1	getLogProb	ability .													58
		5.68.2.2	getProbabil	lity													59
5.69	eu.ami	dst.core.uti	ils.Utils Clas	s Referen	ıce												59
	5.69.1	Detailed [	Description														59
5.70	eu.ami	dst.core.va	ıriables.Varia	able Interf	ace Refe	rence											59
	5.70.1	Detailed [	Description														60
5.71	eu.ami	dst.core.va	ıriables.Varia	ableBuilde	er Class F	Referen	ce										60
	5.71.1	Detailed [	Description														60
5.72	eu.ami	dst.core.uti	ils.Vector Int	erface Re	ference .												60
	5.72.1	Detailed [	Description														61
5.73	eu.ami	dst.core.da	atabase.filere	aders.arf	fWekaRe	eader.W	ekaDa	ataFi	leRe	ade	r Cla	iss	Refe	erend	e.		61
	5.73.1	Detailed [	Description														61

# Chapter 1

# Namespace Index

### 1.1 Packages

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

eu.amidst.core.database	7
eu.amidst.core.database.filereaders	7
eu.amidst.core.distribution	8
eu.amidst.core.exponentialfamily	9
eu.amidst.core.variables	g

2 Namespace Index

## **Chapter 2**

## **Hierarchical Index**

### 2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:	
eu.amidst.core.database.filereaders.arffFileReader.ArffDataStream	 11
eu.amidst.core.variables.Assignment	 12
eu.amidst.core.database.Attribute	 12
eu.amidst.core.database.Attributes	 13
$eu. a midst. core. database. filereaders. arff File Reader. Drilling Attributes \ldots \\$	 . 24
eu.amidst.core.modelstructure.BayesianNetwork	 13
eu.amidst.core.database.dynamics.BucketSequenceData	 14
eu.amidst.core.database.dynamics.BucketSequenceStream	14
eu.amidst.staticmodelling.models.Classifier	15
eu.amidst.core.huginlink.ConverterToAMIDST	18
eu.amidst.core.huginlink.ConverterToHugin	18
eu.amidst.core.modelstructure.DAG	18
eu.amidst.core.database.filereaders.DataFileReader	
eu. a midst. core. database. filereaders. arff Weka Reader. Weka Data File Reader. Arff Weka Reader. Weka Data File Reader. Arff Weka Reader. Weka Data File Reader. We will be a file File Reader. We will be a file File File File File File File File F	
eu.amidst.core.database.DataInstance	 19
eu.amidst.core.database.filereaders.DynamicDataInstance	 25
eu.amidst.core.database.filereaders.StaticDataInstance	 55
eu.amidst.core.database.DataOnDisk	 20
eu.amidst.core.database.filereaders.DynamicDataOnDiskFromFile	 26
eu.amidst.core.database.filereaders.DynamicDataOnMemoryFromFile .	 27
eu.amidst.core.database.filereaders.StaticDataOnDiskFromFile	 56
$eu. a midst. core. database. filereaders. Static Data On Memory From File \ . \ . \ .$	 56
eu.amidst.core.database.DataOnMemory	 20
eu.amidst.core.database.filereaders.DynamicDataOnMemoryFromFile .	 27
eu.amidst.core.database.filereaders.StaticDataOnMemoryFromFile	 56
eu.amidst.core.database.DataOnStream	 21
eu.amidst.core.database.filereaders.DynamicDataOnDiskFromFile	 26
eu.amidst.core.database.filereaders.DynamicDataOnMemoryFromFile .	
eu.amidst.core.database.filereaders.StaticDataOnDiskFromFile	
eu.amidst.core.database.filereaders.StaticDataOnMemoryFromFile	 56
eu.amidst.core.database.filereaders.DataRow	 21
eu.amidst.core.database.filereaders.arffWekaReader.DataRowWeka	 22
eu.amidst.core.database.filereaders.DataRowMissing	
eu.amidst.core.distribution.Distribution	
eu.amidst.core.distribution.ConditionalDistribution	
eu.amidst.core.distribution.Multinomial MultinomialParents	

4 Hierarchical Index

eu.amidst.core.distribution.Normal_MultinomialNormalParents
eu.amidst.core.distribution.Normal_MultinomialParents
eu.amidst.core.distribution.Normal_NormalParents
eu.amidst.core.distribution.UnivariateDistribution
eu.amidst.core.distribution.Multinomial
eu.amidst.core.distribution.Normal
eu.amidst.core.distribution.DistributionBuilder
eu.amidst.core.variables.DistType
eu.amidst.core.modelstructure.DynamicBayesianNetwork
eu.amidst.core.variables.DynamicVariables
eu.amidst.core.exponentialfamily.EF_Distribution
eu.amidst.core.exponentialfamily.EF_ConditionalDistribution
eu.amidst.core.exponentialfamily.EF_BaseDistribution_MultinomialParents< E extends EF_←
Distribution >
eu.amidst.core.exponentialfamily.EF_UnivariateDistribution
eu.amidst.core.exponentialfamily.EF_Multinomial
eu.amidst.core.exponentialfamily.EF_Normal
eu.amidst.core.exponentialfamily.EF_DistributionBuilder
eu.amidst.core.database.filereaders.arffFileReader.Keys
eu.amidst.Main
eu.amidst.core.utils.MultinomialIndex
eu.amidst.core.potential.MultivariateGaussian
eu.amidst.core.database.filereaders.NextDynamicDataInstance
eu.amidst.core.huginlink.Others
eu.amidst.core.modelstructure.ParentSet
eu.amidst.core.potential.Potential
eu.amidst.core.potential.ConstantPotential
eu.amidst.core.potential.MultivariateGaussianCF
eu.amidst.core.potential.PotentialFunctional
eu.amidst.core.potential.PotentialTable
eu.amidst.core.database.dynamics.SequenceDataStream
eu.amidst.core.database.dynamics.readers.SequenceDataStreamReaderFromFile
eu.amidst.core.database.dynamics.SequenceStreamWindow
eu.amidst.core.variables.StateSpaceType
eu.amidst.core.variables.StaticVariables
eu.amidst.core.utils.Utils
eu.amidst.core.variables.Variable
eu.amidst.core.variables.VariableBuilder
eu.amidst.core.utils.Vector
eu.amidst.core.utils.ArrayVector
eu.amidst.core.exponentialfamily.MomentParameters
eu.amidst.core.exponentialfamily.NaturalParameters
eu.amidst.core.exponentialfamily.SufficientStatistics
IOException
eu.amidst.core.database.filereaders.arffFileReader.ArffParserException

## **Chapter 3**

## **Class Index**

### 3.1 Class List

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

eu.amidst.core.database.filereaders.arffFileReader.ArffDataStream
eu.amidst.core.database.filereaders.arffFileReader.ArffParserException
eu.amidst.core.utils.ArrayVector
eu.amidst.core.variables.Assignment
eu.amidst.core.database.Attribute
eu.amidst.core.database.Attributes
eu.amidst.core.modelstructure.BayesianNetwork
eu.amidst.core.database.dynamics.BucketSequenceData
eu.amidst.core.database.dynamics.BucketSequenceStream
eu.amidst.staticmodelling.models.Classifier
eu.amidst.core.distribution.ConditionalDistribution
eu.amidst.core.potential.ConstantPotential
eu.amidst.core.huginlink.ConverterToAMIDST
eu.amidst.core.huginlink.ConverterToHugin18
eu.amidst.core.modelstructure.DAG
eu.amidst.core.database.filereaders.DataFileReader
eu.amidst.core.database.DataInstance
eu.amidst.core.database.DataOnDisk
eu.amidst.core.database.DataOnMemory
eu.amidst.core.database.DataOnStream
eu.amidst.core.database.filereaders.DataRow
eu.amidst.core.database.filereaders.DataRowMissing
eu.amidst.core.database.filereaders.arffWekaReader.DataRowWeka
eu.amidst.core.distribution.Distribution
eu.amidst.core.distribution.DistributionBuilder
eu.amidst.core.variables.DistType
eu.amidst.core.database.filereaders.arffFileReader.DrillingAttributes
eu.amidst.core.modelstructure.DynamicBayesianNetwork
eu.amidst.core.database.filereaders.DynamicDataInstance
eu.amidst.core.database.filereaders.DynamicDataOnDiskFromFile
eu.amidst.core.database.filereaders.DynamicDataOnMemoryFromFile
eu.amidst.core.variables.DynamicVariables
eu.amidst.core.exponentialfamily.EF_BaseDistribution_MultinomialParents< E extends EF_Distribution > 28
eu.amidst.core.exponentialfamily.EF_ConditionalDistribution
eu.amidst.core.exponentialfamily.EF_Distribution
eu.amidst.core.exponentialfamily.EF_DistributionBuilder
eu.amidst.core.exponentialfamily.EF_Multinomial
eu.amidst.core.exponentialfamily.EF_Normal

6 Class Index

eu.amidst.core.exponentialfamily.EF_UnivariateDistribution	2
eu.amidst.core.database.filereaders.arffFileReader.Keys	
eu.amidst.Main	3
eu.amidst.core.exponentialfamily.MomentParameters	3
eu.amidst.core.distribution.Multinomial	4
eu.amidst.core.distribution.Multinomial_MultinomialParents	3
eu.amidst.core.utils.MultinomialIndex	3
eu.amidst.core.potential.MultivariateGaussian	1
eu.amidst.core.potential.MultivariateGaussianCF	1
eu.amidst.core.exponentialfamily.NaturalParameters	2
eu.amidst.core.database.filereaders.NextDynamicDataInstance	2
eu.amidst.core.distribution.Normal	3
eu.amidst.core.distribution.Normal_MultinomialNormalParents	5
eu.amidst.core.distribution.Normal_MultinomialParents	7
eu.amidst.core.distribution.Normal_NormalParents	9
eu.amidst.core.huginlink.Others	1
eu.amidst.core.modelstructure.ParentSet	2
eu.amidst.core.potential.Potential	2
eu.amidst.core.potential.PotentialFunctional	3
eu.amidst.core.potential.PotentialTable	3
eu.amidst.core.database.dynamics.SequenceDataStream	4
eu.amidst.core.database.dynamics.readers.SequenceDataStreamReaderFromFile	4
eu.amidst.core.database.dynamics.SequenceStreamWindow	4
eu.amidst.core.variables.StateSpaceType	ō
eu.amidst.core.database.filereaders.StaticDataInstance	ō
eu.amidst.core.database.filereaders.StaticDataOnDiskFromFile	3
eu.amidst.core.database.filereaders.StaticDataOnMemoryFromFile	ô
eu.amidst.core.variables.StaticVariables	7
eu.amidst.core.exponentialfamily.SufficientStatistics	7
eu.amidst.core.distribution.UnivariateDistribution	3
eu.amidst.core.utils.Utils	Э
eu.amidst.core.variables.Variable	9
eu.amidst.core.variables.VariableBuilder	J
eu.amidst.core.utils.Vector	J
au amidet cara databasa filoroadore arffWoka Poador Woka Data Filo Poador	4

### **Chapter 4**

## **Namespace Documentation**

#### 4.1 Package eu.amidst.core.database

#### **Packages**

· package filereaders

#### **Classes**

- · class Attribute
- class Attributes
- interface DataInstance
- interface DataOnDisk
- · interface DataOnMemory
- interface DataOnStream

#### 4.1.1 Detailed Description

ISSUE LIST \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. The number of states should be parsed and stored.

\*\*\*\*\*\*\*\* ISSUE LIST \*\*\*\*\*\*\*\*

1. (Andres) Add a "close" method to close the possible linked file or whatever.

### 4.2 Package eu.amidst.core.database.filereaders

#### Classes

- interface DataFileReader
- interface DataRow
- class DataRowMissing
- class DynamicDataInstance
- class DynamicDataOnDiskFromFile
- class DynamicDataOnMemoryFromFile
- class NextDynamicDataInstance

- · class StaticDataInstance
- class StaticDataOnDiskFromFile
- · class StaticDataOnMemoryFromFile

#### 4.2.1 Detailed Description

ISSUE LIST \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. We could eliminate the if(timeIDcounter == 1) in nextDataInstance\_NoTimeID\_NoSeq if we maintain a future DataRow (we read an extra row in advance). Then we would need the method public boolean isNull(){ return (present==null || past==null); }

#### 4.3 Package eu.amidst.core.distribution

#### Classes

- · class ConditionalDistribution
- · class Distribution
- · class DistributionBuilder
- class Multinomial
- · class Multinomial MultinomialParents
- · class Normal
- class Normal MultinomialNormalParents
- class Normal\_MultinomialParents
- class Normal\_NormalParents
- class UnivariateDistribution

#### 4.3.1 Detailed Description

ISSUE LIST \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

- 1. In general, should we clone attributes in the constructor to avoid bad uses of input variables later on?
- 2. How are we going to update the probabilities? Value by value? Or directly with the whole set of probabilities? or both? Two methods are included: setProbabilities(double[] probabilities) and setProbabilityOfState(int index, double value)
- 3. Is needed the method setProbabilityOfState?

1. getConditioningVariables change to getParentsVariables()

ISSUE LIST \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Do we need here the min and max of the variable, for instance, to check that the input value in compute ← ProbabilityOf(value) is in the range [min,max]?

ISSUES \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

- 1. CODING: this.multinomialParents or multinomialParents? Common criteria.
  - methods are ordered? alphabetically?

ISSUE LIST \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

- 1. In the constructor, should we initialize the CLG attributes in this way?
- 2. The name of the method computeProbabilityOf(..) is a bit confusing for continuous domains. It does not compute probabilities but the value for the density function which is not a probability. However as this class implements this method of ConditionalDistribution, we could leave like this.
- 3. QAPlug gives a warning when using the same name for a attribute and a given argument, e.g. this.var = var

#### 4.4 Package eu.amidst.core.exponentialfamily

#### Classes

- class EF\_BaseDistribution\_MultinomialParents< E extends EF\_Distribution >
- class EF\_ConditionalDistribution
- · class EF Distribution
- · class EF DistributionBuilder
- · class EF\_Multinomial
- · class EF Normal
- · class EF\_UnivariateDistribution
- · class MomentParameters
- · class NaturalParameters
- · class SufficientStatistics

#### 4.4.1 Detailed Description

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* ISSUE LIST \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. getConditioningVariables change to getParentsVariables()

- $1. \ \ Make \ Sufficient Statics \ an \ static \ class \ to \ avoid \ the \ creation \ of \ an \ object \ in \ each \ call \ to \ get Suff Statistics();$
- 2. Make naturalParameters and momentParameters statics?

#### 4.5 Package eu.amidst.core.variables

#### **Classes**

- · class Assignment
- enum DistType
- · class DynamicVariables
- enum StateSpaceType
- class StaticVariables
- · interface Variable
- · class VariableBuilder

#### 4.5.1 Detailed Description

ISSUE LIST \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

- 1. Rename to DynamicVariables
- 2. We can/should remove all setters from VariableImplementation right?
- 3. Is there any need for the field atts? It is only used in the constructor.
- 4. If the fields in VariableImplementation are all objects then the TemporalClone only contains pointers, which would ensure consistency, although we are not planing to modify these values.

### **Chapter 5**

### **Class Documentation**

#### 5.1 eu.amidst.core.database.filereaders.arffFileReader.ArffDataStream Class Reference

#### 5.1.1 Detailed Description

Created by sigveh on 10/7/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/database/filereaders/arffFileReader/ArffData
 Stream.java

# 5.2 eu.amidst.core.database.filereaders.arffFileReader.ArffParserException Class Reference

Inheritance diagram for eu.amidst.core.database.filereaders.arffFileReader.ArffParserException:



**Public Member Functions** 

• ArffParserException (String message)

#### 5.2.1 Detailed Description

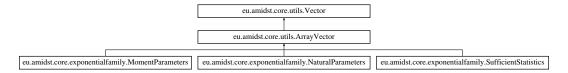
Created by sigveh on 10/8/14.

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

 'Users/ana/Documents/core/src/main/java/eu/amidst/core/database/filereaders/arffFileReader/ArffParser← Exception.java

#### 5.3 eu.amidst.core.utils.ArrayVector Class Reference

Inheritance diagram for eu.amidst.core.utils.ArrayVector:



#### **Public Member Functions**

- · ArrayVector (int size)
- ArrayVector (double[] vec)
- double **get** (int i)
- void set (int i, double val)
- int size ()

#### **Additional Inherited Members**

#### 5.3.1 Detailed Description

Created by andresmasegosa on 12/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/utils/ArrayVector.java

#### 5.4 eu.amidst.core.variables.Assignment Class Reference

#### **Public Member Functions**

- Assignment (int nOfVars)
- double **getValue** (Variable key)
- void setValue (Variable var, Double value)
- Set < Map.Entry < Variable, Double >> entrySet ()

#### 5.4.1 Detailed Description

Created by ana@cs.aau.dk on 03/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/variables/Assignment.java

#### 5.5 eu.amidst.core.database.Attribute Class Reference

#### **Public Member Functions**

Attribute (int index, String name, String unit, StateSpaceType stateSpaceType, int numberOfStates)

- Attribute (int index, String name, StateSpaceType stateSpaceType, int numberOfStates)
- Attribute (String name, StateSpaceType stateSpaceType, int numberOfStates)
- int getIndex ()
- String getUnit ()
- String getName ()
- StateSpaceType getStateSpaceType ()
- int getNumberOfStates ()
- boolean equals (Object o)
- int hashCode ()

#### 5.5.1 Detailed Description

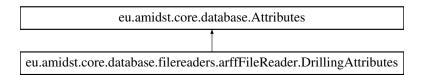
Created by sigveh on 10/20/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/database/Attribute.java

#### 5.6 eu.amidst.core.database.Attributes Class Reference

Inheritance diagram for eu.amidst.core.database.Attributes:



#### **Public Member Functions**

- Attributes (List< Attribute > attributes)
- List< Attribute > getList ()
- List< Attribute > getListExceptTimeAndSeq ()
- void print ()
- Attribute getAttributeByName (String name)

#### 5.6.1 Detailed Description

Created by sigveh on 10/16/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/database/Attributes.java

#### 5.7 eu.amidst.core.modelstructure.BayesianNetwork Class Reference

- void setDistribution (Variable var, ConditionalDistribution distribution)
- int getNumberOfVars ()
- StaticVariables getStaticVariables ()
- DAG getDAG ()
- List < Variable > getVariables ()

#### **Static Public Member Functions**

• static BayesianNetwork newBayesianNetwork (DAG dag)

#### 5.7.1 Detailed Description

Created by afa on 02/07/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/modelstructure/BayesianNetwork.java

#### 5.8 eu.amidst.core.database.dynamics.BucketSequenceData Interface Reference

**Public Member Functions** 

- int getMarkovOrder ()
- boolean hasMoreData ()
- DynamicDataInstance nextSequenceData ()
- boolean isReseteable ()
- · void reset ()

#### 5.8.1 Detailed Description

Created by afa on 03/07/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/database/dynamics/BucketSequenceData.java

#### 5.9 eu.amidst.core.database.dynamics.BucketSequenceStream Interface Reference

**Public Member Functions** 

- Attributes getDynamicAttributes ()
- int getMarkovOrder ()
- boolean hasMoreData ()
- BucketSequenceData nextBucketSequenceData ()
- boolean isReseteable ()
- · void reset ()

#### 5.9.1 Detailed Description

Created by afa on 03/07/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/database/dynamics/BucketSequenceStream.java

#### 5.10 eu.amidst.staticmodelling.models.Classifier Interface Reference

**Public Member Functions** 

- double[] predict (DataInstance instance)
- int getClassVarID ()
- void setClassVarID (int varID)

#### 5.10.1 Detailed Description

Created by afa on 02/07/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/staticmodelling/models/Classifier.java

#### 5.11 eu.amidst.core.distribution.ConditionalDistribution Class Reference

Inheritance diagram for eu.amidst.core.distribution.ConditionalDistribution:



#### **Public Member Functions**

- List< Variable > getConditioningVariables ()
- double getConditionalProbability (Assignment assignment)
- abstract double getLogConditionalProbability (Assignment assignment)

#### **Protected Attributes**

• List< Variable > parents

#### 5.11.1 Detailed Description

This interface generalizes the set of possible conditional distributions.

Author

Antonio Fernández

Version

1.0

Since

2014-11-3

#### 5.11.2 Member Function Documentation

 $5.11.2.1 \quad double \ eu. a midst. core. distribution. Conditional Distribution. get Conditional Probability ( \ Assignment \ assignment) \\$ 

Evaluates the conditional distribution given a value of the variable and an assignment of the parents.

#### **Parameters**

assignment	An Assignment for the parents.
------------	--------------------------------

#### Returns

A double value with the evaluated distribution.

5.11.2.2 List < Variable > eu.amidst.core.distribution.ConditionalDistribution.getConditioningVariables ( )

Gets the set of conditioning variables

#### Returns

An unmodifiable List object with the set of conditioning variables.

5.11.2.3 abstract double eu.amidst.core.distribution.ConditionalDistribution.getLogConditionalProbability ( Assignment assignment ) [abstract]

Evaluates the conditional distribution given a value of the variable and an assignment of the parents.

#### **Parameters**

assignment	An Assignment for the parents.

#### Returns

A double value with the logarithm of the evaluated distribution.

#### 5.11.3 Member Data Documentation

**5.11.3.1** List < Variable > eu.amidst.core.distribution.ConditionalDistribution.parents [protected]

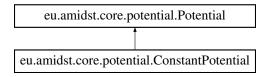
The list of parents of the variable

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/distribution/ConditionalDistribution.java

#### 5.12 eu.amidst.core.potential.ConstantPotential Class Reference

Inheritance diagram for eu.amidst.core.potential.ConstantPotential:



- ConstantPotential (double val)
- void setVariables (List variables)
- List getVariables ()
- void combine (Potential pot)
- · void marginalize (List variables)

#### 5.12.1 Detailed Description

Created by andresmasegosa on 28/08/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/potential/ConstantPotential.java

#### 5.13 eu.amidst.core.huginlink.ConverterToAMIDST Class Reference

#### **Public Member Functions**

- ConverterToAMIDST (Domain huginNetwork)
- BayesianNetwork getAmidstNetwork ()
- · void setNodes ()
- void setStructure ()
- void setMultinomial\_MultinomialParents (Node huginVar)
- void setDistributions (NodeList huginNodes)

#### 5.13.1 Detailed Description

Created by afa on 14/11/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/huginlink/ConverterToAMIDST.java

#### 5.14 eu.amidst.core.huginlink.ConverterToHugin Class Reference

#### **Public Member Functions**

- Domain getHuginNetwork ()
- void setNodes (List< Variable > amidstVars)
- void setStructure (DAG dag)
- void setMultinomial\_MultinomialParents (ConditionalDistribution dist)
- void setNormal NormalParents (ConditionalDistribution dist, int assign i)
- void **setNormal** (Normal dist, int i)
- void setNormal\_MultinomialParents (ConditionalDistribution dist)
- void setNormal\_MultinomialNormalParents (ConditionalDistribution dist)
- void setDistributions (BayesianNetwork bn)
- void setBayesianNetwork (BayesianNetwork bn)

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/huginlink/ConverterToHugin.java

#### 5.15 eu.amidst.core.modelstructure.DAG Class Reference

- DAG (StaticVariables variables)
- StaticVariables getVariables ()
- ParentSet getParentSet (Variable var)
- boolean containCycles ()

#### 5.15.1 Detailed Description

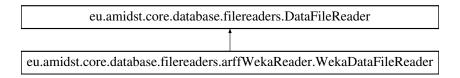
Created by Hanen on 13/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/modelstructure/DAG.java

#### 5.16 eu.amidst.core.database.filereaders.DataFileReader Interface Reference

Inheritance diagram for eu.amidst.core.database.filereaders.DataFileReader:



#### **Public Member Functions**

- Attributes getAttributes ()
- DataRow nextDataRow ()
- boolean hasMoreDataRows ()
- · void reset ()
- boolean doesItReadThisFileExtension (String fileExtension)

#### 5.16.1 Detailed Description

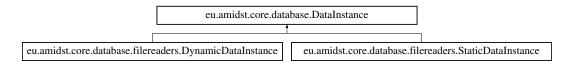
Created by andresmasegosa on 11/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/database/filereaders/DataFileReader.java

#### 5.17 eu.amidst.core.database.DataInstance Interface Reference

Inheritance diagram for eu.amidst.core.database.DataInstance:



- double getValue (Variable var)
- int getSequenceID ()
- int getTimeID ()

#### 5.17.1 Detailed Description

Created by ana@cs.aau.dk on 10/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/database/DataInstance.java

#### 5.18 eu.amidst.core.database.DataOnDisk Interface Reference

Inheritance diagram for eu.amidst.core.database.DataOnDisk:

```
ea amidst core database fliereaders. Dynamic/DataOnDiskFromFile | ea amidst core database fliereaders. Static DataOnDiskFromFile | ea amidst core database fliere
```

#### **Public Member Functions**

- DataInstance nextDataInstance ()
- boolean hasMoreDataInstances ()
- Attributes getAttributes ()
- void restart ()

#### 5.18.1 Detailed Description

Created by afa on 02/07/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/database/DataOnDisk.java

#### 5.19 eu.amidst.core.database.DataOnMemory Interface Reference

 $Inheritance\ diagram\ for\ eu.amidst.core.database.DataOn Memory:$ 

```
eu.amidst.core.database.DataOnMemory

eu.amidst.core.database.filereaders.DynamicDataOnMemoryFromFile

eu.amidst.core.database.filereaders.StaticDataOnMemoryFromFile
```

#### **Public Member Functions**

- int getNumberOfDataInstances ()
- DataInstance getDataInstance (int i)
- Attributes getAttributes ()

#### 5.19.1 Detailed Description

Created by andresmasegosa on 11/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/database/DataOnMemory.java

#### 5.20 eu.amidst.core.database.DataOnStream Interface Reference

Inheritance diagram for eu.amidst.core.database.DataOnStream:



#### **Public Member Functions**

- DataInstance nextDataInstance ()
- boolean hasMoreDataInstances ()
- Attributes getAttributes ()

#### 5.20.1 Detailed Description

Created by afa on 02/07/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/database/DataOnStream.java

#### 5.21 eu.amidst.core.database.filereaders.DataRow Interface Reference

Inheritance diagram for eu.amidst.core.database.filereaders.DataRow:



#### **Public Member Functions**

• double getValue (Attribute att)

#### 5.21.1 Detailed Description

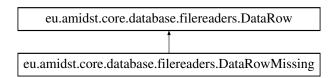
Created by andresmasegosa on 11/11/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/database/filereaders/DataRow.java

#### 5.22 eu.amidst.core.database.filereaders.DataRowMissing Class Reference

Inheritance diagram for eu.amidst.core.database.filereaders.DataRowMissing:



#### **Public Member Functions**

• double getValue (Attribute att)

#### 5.22.1 Detailed Description

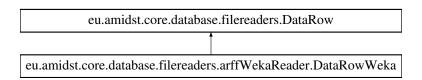
Created by ana@cs.aau.dk on 13/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/database/filereaders/DataRowMissing.java

# 5.23 eu.amidst.core.database.filereaders.arffWekaReader.DataRowWeka Class Reference

 $Inheritance\ diagram\ for\ eu. a midst. core. database. file readers. arff Weka Reader. Data Row Weka:$ 



#### **Public Member Functions**

- DataRowWeka (Instance dataRow)
- double getValue (Attribute att)

#### 5.23.1 Detailed Description

Created by ana@cs.aau.dk on 14/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/database/filereaders/arffWekaReader/DataRow 
Weka.java

#### 5.24 eu.amidst.core.distribution.Distribution Class Reference

Inheritance diagram for eu.amidst.core.distribution.Distribution:



#### **Public Member Functions**

Variable getVariable ()

#### **Protected Attributes**

· Variable var

#### 5.24.1 Detailed Description

Created by afa on 12/11/14.

#### 5.24.2 Member Function Documentation

5.24.2.1 Variable eu.amidst.core.distribution.Distribution.getVariable ( )

Gets the variable of the distribution

Returns

A Variable object.

#### 5.24.3 Member Data Documentation

**5.24.3.1 Variable eu.amidst.core.distribution.Distribution.var** [protected]

The variable of the distribution

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/distribution/Distribution.java

#### 5.25 eu.amidst.core.distribution.DistributionBuilder Class Reference

**Static Public Member Functions** 

• static ConditionalDistribution newDistribution (Variable mainVar, List< Variable > conditioningVars)

#### 5.25.1 Detailed Description

Created by andresmasegosa on 11/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/distribution/DistributionBuilder.java

#### 5.26 eu.amidst.core.variables.DistType Enum Reference

**Public Attributes** 

MULTINOMIAL

#### 5.26.1 Detailed Description

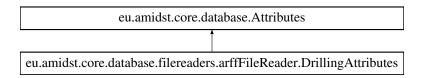
Created by Hanen on 05/11/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/variables/DistType.java

# 5.27 eu.amidst.core.database.filereaders.arffFileReader.DrillingAttributes Class Reference

Inheritance diagram for eu.amidst.core.database.filereaders.arffFileReader.DrillingAttributes:



#### **Public Member Functions**

- Attribute getMFI ()
- Attribute getRPM ()
- Attribute getSPP ()
- List< Attribute > getList ()
- void print ()
- Attribute getAttributeByName (String name)

#### 5.27.1 Detailed Description

Created by sigveh on 10/16/14.

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

#### 5.28 eu.amidst.core.modelstructure.DynamicBayesianNetwork Class Reference

- void initializeDistributions ()
- int getNumberOfNodes ()
- DynamicVariables getDynamicVariables ()
- Variable getVariableById (int varID)
- Variable getTemporalCloneById (int varID)
- Variable getTemporalCloneFromVariable (Variable variable)
- ParentSet getParentSetTimeT (Variable var)
- Distribution getDistributionTimeT (Variable var)
- ParentSet getParentSetTime0 (Variable var)
- Distribution getDistributionTime0 (Variable var)

**Static Public Member Functions** 

• static DynamicBayesianNetwork newDynamicBayesianNetwork (DynamicVariables variables)

#### 5.28.1 Detailed Description

This class implements a dynamic Bayesian network.

**Author** 

```
afalvarez@ual.es, andres@cs.aau.dk & ana@cs.aau.dk
```

Version

1.0

Since

2014-07-3

#### 5.28.2 Member Function Documentation

5.28.2.1 void eu.amidst.core.modelstructure.DynamicBayesianNetwork.initializeDistributions ( )

Initialize the Distributions of the variables based on their StateSpaceType

5.28.2.2 static DynamicBayesianNetwork eu.amidst.core.modelstructure.DynamicBayesianNetwork.newDynamic

BayesianNetwork ( DynamicVariables variables ) [static]

The class public constructor, as a factory pattern

Parameters

variables	The variables or list of variables

Returns

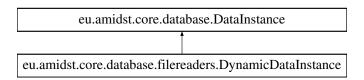
A DynamicBayesianNetwork with the given list of variables

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/modelstructure/DynamicBayesianNetwork.java

#### 5.29 eu.amidst.core.database.filereaders.DynamicDataInstance Class Reference

Inheritance diagram for eu.amidst.core.database.filereaders.DynamicDataInstance:



#### **Public Member Functions**

- DynamicDataInstance (DataRow dataRowPast\_, DataRow dataRowPresent\_, int sequenceID\_, int timeI

  D )
- double **getValue** (Variable var)
- int getSequenceID ()
- int getTimeID ()

#### 5.29.1 Detailed Description

Created by andresmasegosa on 11/11/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/database/filereaders/DynamicDataInstance.java

#### 5.30 eu.amidst.core.database.filereaders.DynamicDataOnDiskFromFile Class Reference

Inheritance diagram for eu.amidst.core.database.filereaders.DynamicDataOnDiskFromFile:



#### **Public Member Functions**

- · DynamicDataOnDiskFromFile (DataFileReader reader)
- DataInstance nextDataInstance ()
- boolean hasMoreDataInstances ()
- Attributes getAttributes ()
- void restart ()

#### 5.30.1 Detailed Description

Created by ana@cs.aau.dk on 12/11/14.

#### 5.30.2 Constructor & Destructor Documentation

5.30.2.1 eu.amidst.core.database.filereaders.DynamicDataOnDiskFromFile.DynamicDataOnDiskFromFile ( DataFileReader reader )

We read the two first rows now, to create the first couple in nextDataInstance

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

## 5.31 eu.amidst.core.database.filereaders.DynamicDataOnMemoryFromFile Class Reference

Inheritance diagram for eu.amidst.core.database.filereaders.DynamicDataOnMemoryFromFile:



## **Public Member Functions**

- DynamicDataOnMemoryFromFile (DataFileReader reader)
- int getNumberOfDataInstances ()
- DataInstance getDataInstance (int i)
- Attributes getAttributes ()
- DataInstance nextDataInstance ()
- boolean hasMoreDataInstances ()
- void restart ()

### 5.31.1 Detailed Description

Created by ana@cs.aau.dk on 12/11/14.

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

## 5.32 eu.amidst.core.variables.DynamicVariables Class Reference

## **Public Member Functions**

- DynamicVariables (Attributes atts)
- DynamicVariables (Attributes atts, HashMap< Attribute, DistType > typeDists)
- Variable getTemporalCloneFromVariable (Variable var)
- Variable getVariableFromTemporalClone (Variable var)
- Variable addHiddenVariable (VariableBuilder builder)
- List< Variable > getVariables ()
- List< Variable > getTemporalClones ()
- Variable getVariableById (int varID)
- Variable getTemporalCloneByld (int varID)
- Variable getVariableByName (String name)
- Variable getTemporalCloneByName (String name)
- int getNumberOfVars ()

## 5.32.1 Detailed Description

Created by afa on 02/07/14.

#### 5.32.2 Constructor & Destructor Documentation

5.32.2.1 eu.amidst.core.variables.DynamicVariables ( Attributes atts, HashMap < Attribute, DistType > typeDists )

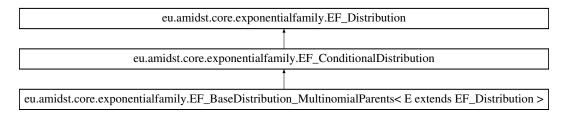
Constructor where the distribution type of random variables is provided as an argument.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/variables/DynamicVariables.java

# 5.33 eu.amidst.core.exponentialfamily.EF\_BaseDistribution\_MultinomialParents< E extends EF\_Distribution > Class Reference

Inheritance diagram for eu.amidst.core.exponentialfamily.EF\_BaseDistribution\_MultinomialParents< E extends E $\leftarrow$  F Distribution >:



#### **Public Member Functions**

- EF\_BaseDistribution\_MultinomialParents (Variable var, List< Variable > parents)
- abstract E createNewBaseDistribution (Variable var, List< Variable > non\_multinomialParents)
- void setEF BaseDistribution (int indexMultinomial, E baseDist)
- E getEF\_BaseDistribution (int indexMultinomial)
- E getEF\_BaseDistribution (DataInstance dataInstance)
- SufficientStatistics getSufficientStatistics (DataInstance instance)
- int sizeOfSufficientStatistics ()
- void setNaturalParameters (NaturalParameters parameters)
- void **setMomentParameters** (MomentParameters parameters)
- void updateNaturalFromMomentParameters ()
- void updateMomentFromNaturalParameters ()
- double computeLogBaseMeasure (DataInstance dataInstance)
- double computeLogNormalizer (NaturalParameters parameters)

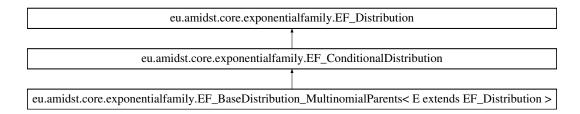
#### **Additional Inherited Members**

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/exponentialfamily/EF\_BaseDistribution\_Multinomial ← Parents.java

## 5.34 eu.amidst.core.exponentialfamily.EF\_ConditionalDistribution Class Reference

Inheritance diagram for eu.amidst.core.exponentialfamily.EF\_ConditionalDistribution:



## **Public Member Functions**

• List< Variable > getConditioningVariables ()

#### **Protected Attributes**

List< Variable > parents

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/exponentialfamily/EF\_ConditionalDistribution.java

## 5.35 eu.amidst.core.exponentialfamily.EF\_Distribution Class Reference

Inheritance diagram for eu.amidst.core.exponentialfamily.EF\_Distribution:



#### **Public Member Functions**

- final Variable getVariable ()
- final NaturalParameters getNaturalParameters ()
- final MomentParameters getMomentParameters ()
- void setNaturalParameters (NaturalParameters parameters)
- void setMomentParameters (MomentParameters parameters)
- abstract void updateNaturalFromMomentParameters ()
- abstract void updateMomentFromNaturalParameters ()
- abstract SufficientStatistics getSufficientStatistics (DataInstance data)
- abstract int sizeOfSufficientStatistics ()
- abstract double computeLogBaseMeasure (DataInstance dataInstance)
- abstract double computeLogNormalizer ()
- double computeProbabilityOf (DataInstance dataInstance)
- double computeLogProbabilityOf (DataInstance dataInstance)

## **Protected Attributes**

- · Variable var
- · NaturalParameters naturalParameters
- MomentParameters momentParameters

## 5.35.1 Detailed Description

Created by andresmasegosa on 13/11/14.

#### 5.35.2 Member Function Documentation

5.35.2.1 final Variable eu.amidst.core.exponentialfamily.EF\_Distribution.getVariable ( )

Gets the variable of the distribution

Returns

A Variable object.

#### 5.35.3 Member Data Documentation

**5.35.3.1 Variable eu.amidst.core.exponentialfamily.EF\_Distribution.var** [protected]

The variable of the distribution

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/exponentialfamily/EF\_Distribution.java

## 5.36 eu.amidst.core.exponentialfamily.EF\_DistributionBuilder Class Reference

**Static Public Member Functions** 

- static
  - EF\_BaseDistribution\_MultinomialParents newEFFromConditionalDistribution (Multinomial\_Multinomial → Parents dist)
- static EF\_Normal toEFDistribution (Normal dist)
- static Normal toDistribution (EF\_Normal ef\_normal)
- static EF\_Multinomial toEFDistribution (Multinomial dist)
- static Multinomial toDistribution (EF\_Multinomial ef\_multinomial)

## 5.36.1 Detailed Description

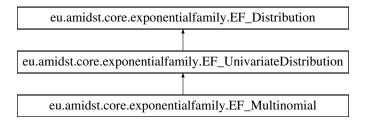
Created by andresmasegosa on 12/11/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/exponentialfamily/EF\_DistributionBuilder.java

## 5.37 eu.amidst.core.exponentialfamily.EF\_Multinomial Class Reference

Inheritance diagram for eu.amidst.core.exponentialfamily.EF\_Multinomial:



#### **Public Member Functions**

- EF Multinomial (Variable var )
- double computeLogBaseMeasure (double val)
- double computeLogNormalizer ()
- SufficientStatistics getSufficientStatistics (double val)
- void updateNaturalFromMomentParameters ()
- void updateMomentFromNaturalParameters ()
- int sizeOfSufficientStatistics ()

#### **Static Public Member Functions**

• static SufficientStatistics sufficientStatistics (int nstates, double val)

#### **Additional Inherited Members**

## 5.37.1 Detailed Description

Created by andresmasegosa on 13/11/14.

## 5.37.2 Constructor & Destructor Documentation

5.37.2.1 eu.amidst.core.exponentialfamily.EF\_Multinomial.EF\_Multinomial ( Variable var\_ )

The class constructor.

**Parameters** 

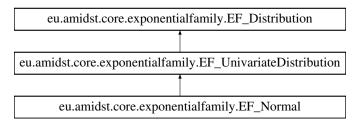
var\_ The variable of the distribution.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/exponentialfamily/EF\_Multinomial.java

## 5.38 eu.amidst.core.exponentialfamily.EF\_Normal Class Reference

Inheritance diagram for eu.amidst.core.exponentialfamily.EF\_Normal:



#### **Public Member Functions**

- EF\_Normal (Variable var\_)
- · double computeLogBaseMeasure (double val)
- double computeLogNormalizer ()
- SufficientStatistics getSufficientStatistics (double val)
- void updateNaturalFromMomentParameters ()
- void updateMomentFromNaturalParameters ()
- int sizeOfSufficientStatistics ()

#### **Static Public Member Functions**

• static SufficientStatistics sufficientStatistics (double val)

#### **Static Public Attributes**

- static int **EXPECTED MEAN** = 0
- static int EXPECTED\_SQUARE = 1

#### **Additional Inherited Members**

#### 5.38.1 Detailed Description

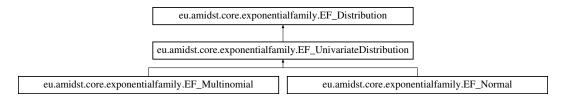
Created by andresmasegosa on 13/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/exponentialfamily/EF\_Normal.java

## 5.39 eu.amidst.core.exponentialfamily.EF\_UnivariateDistribution Class Reference

Inheritance diagram for eu.amidst.core.exponentialfamily.EF\_UnivariateDistribution:



## **Public Member Functions**

- abstract double computeLogBaseMeasure (double val)
- abstract SufficientStatistics getSufficientStatistics (double val)
- · double computeProbabilityOf (double val)
- double computeLogProbabilityOf (double val)
- SufficientStatistics getSufficientStatistics (DataInstance data)
- double computeLogBaseMeasure (DataInstance dataInstance)

#### **Additional Inherited Members**

## 5.39.1 Detailed Description

Created by andresmasegosa on 12/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/exponentialfamily/EF\_UnivariateDistribution.java

## 5.40 eu.amidst.core.database.filereaders.arffFileReader.Keys Class Reference

**Public Member Functions** 

- **Keys** (int[] doubleKeys, int[] intKeys)
- int[] getDoubleKeys ()
- int[] getIntKeys ()

## 5.40.1 Detailed Description

Created by sigveh on 10/20/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/database/filereaders/arffFileReader/Keys.java

## 5.41 eu.amidst.Main Class Reference

**Static Public Member Functions** 

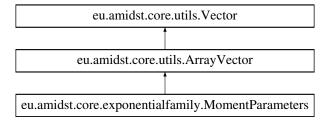
• static void main (String[] args)

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

/Users/ana/Documents/core/src/main/java/eu/amidst/Main.java

## 5.42 eu.amidst.core.exponentialfamily.MomentParameters Class Reference

Inheritance diagram for eu.amidst.core.exponentialfamily.MomentParameters:



## **Public Member Functions**

- MomentParameters (int size)
- MomentParameters (double[] vec)

#### **Additional Inherited Members**

## 5.42.1 Detailed Description

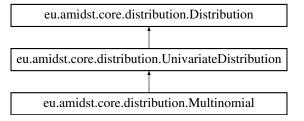
Created by andresmasegosa on 12/11/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/exponentialfamily/MomentParameters.java

## 5.43 eu.amidst.core.distribution.Multinomial Class Reference

Inheritance diagram for eu.amidst.core.distribution.Multinomial:



#### **Public Member Functions**

- Multinomial (Variable var)
- void setProbabilities (double[] probabilities)
- void setProbabilityOfState (int state, double prob)
- double getProbabilityOfState (int state)
- double[] getProbabilities ()
- double getLogProbability (double value)

## **Additional Inherited Members**

#### 5.43.1 Detailed Description

This class implements a univariate multinomial distribution.

Author

Antonio Fernández

Version

1.0

Since

2014-11-3

#### 5.43.2 Constructor & Destructor Documentation

5.43.2.1 eu.amidst.core.distribution.Multinomial.Multinomial ( Variable var )

The class constructor.

<b>D</b> -	 	-4	 
	m		

var	The variable of the distribution.

#### 5.43.3 Member Function Documentation

5.43.3.1 double eu.amidst.core.distribution.Multinomial.getLogProbability ( double value )

Computes the logarithm of the probability for a given variable state.

#### **Parameters**

value	The position of the variable state in the array of probabilities (represented as a double for
	generality reasons).

#### Returns

A double value with the logarithm of the probability.

5.43.3.2 double [] eu.amidst.core.distribution.Multinomial.getProbabilities ( )

Gets the array of probabilities for the different states of the variable.

#### Returns

An array of double with the probabilities.

5.43.3.3 double eu.amidst.core.distribution.Multinomial.getProbabilityOfState ( int state )

#### **Parameters**

state

Returns

5.43.3.4 void eu.amidst.core.distribution.Multinomial.setProbabilities ( double[] probabilities )

Sets the probability values to the distribution.

**Parameters** 

probabilities An array of probabilities in the same order as the variable states.

5.43.3.5 void eu.amidst.core.distribution.Multinomial.setProbabilityOfState (int state, double prob)

Set a probability value in a given position in the array of probabilities.

**Parameters** 

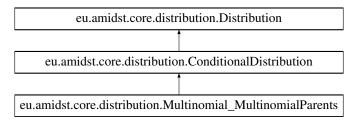
state	The position in which the probability is set.
prob	A probability value.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/distribution/Multinomial.java

## 5.44 eu.amidst.core.distribution.Multinomial MultinomialParents Class Reference

Inheritance diagram for eu.amidst.core.distribution.Multinomial\_MultinomialParents:



#### **Public Member Functions**

- Multinomial\_MultinomialParents (Variable var, List< Variable > parents)
- Multinomial[] getProbabilities ()
- void setMultinomial (int position, Multinomial multinomialDistribution)
- · void setMultinomial (Assignment parentAssignment, Multinomial multinomialDistribution)
- Multinomial getMultinomial (Assignment parentAssignment)
- Multinomial **getMultinomial** (int position)
- · double getLogConditionalProbability (Assignment parentAssignment)

## **Additional Inherited Members**

## 5.44.1 Detailed Description

This class implements a conditional distribution of a multinomial variable given a set of multinomial parents.

**Author** 

Antonio Fernández

Version

1.0

Since

2014-11-4

## 5.44.2 Constructor & Destructor Documentation

5.44.2.1 eu.amidst.core.distribution.Multinomial\_MultinomialParents.Multinomial\_MultinomialParents ( Variable var, List< Variable > parents )

The class constructor.

#### **Parameters**

var	The variable of the distribution.
parents	The set of parents of the variable.

#### 5.44.3 Member Function Documentation

5.44.3.1 double eu.amidst.core.distribution.Multinomial\_MultinomialParents.getLogConditionalProbability ( Assignment parentAssignment )

Computes the logarithm of the probability of the variable for a given state and a parent assignment.

#### **Parameters**

parent⇔	An Assignment for the parents.
Assignment	

#### Returns

A double value with the logarithm of the probability.

5.44.3.2 Multinomial eu.amidst.core.distribution.Multinomial\_MultinomialParents.getMultinomial ( Assignment parentAssignment )

Gets the Multinomial distribution for given a parents assignment.

#### **Parameters**

parent⇔	An Assignment for the parents.
Assignment	

#### Returns

A Multinomial object.

5.44.3.3 void eu.amidst.core.distribution.Multinomial\_MultinomialParents.setMultinomial ( int position, Multinomial multinomialDistribution )

Sets a  ${\tt Multinomial}$  distribution in a given position in the array of probabilities.

#### **Parameters**

position	The position in which the distribution is set.
multinomial⇔	A Multinomial object.
Distribution	

5.44.3.4 void eu.amidst.core.distribution.Multinomial\_MultinomialParents.setMultinomial ( Assignment parentAssignment, Multinomial multinomialDistribution )

Sets a Multinomial distribution in a position in the array of probabilities determined by a given parents assignment.

#### **Parameters**

parent⇔	An Assignment for the parents.
Assignment	
multinomial⇔	A Multinomial object.
Distribution	

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/distribution/Multinomial MultinomialParents.java

## 5.45 eu.amidst.core.utils.MultinomialIndex Class Reference

#### Static Public Member Functions

- static int getIndexFromVariableAssignment (List< Variable > vars, Assignment assignment)
- static int getIndexFromVariableAssignment (List< Variable > vars, List< Double > assignment)
- static int **getIndexFromDataInstance** (List< Variable > vars, DataInstance dataInstance)
- static int getIndexFromVariableAssignment (List< Variable > vars, double[] assignment)
- static double[] getVariableAssignmentFromIndex (List< Variable > vars, int index)
- static int getNumberOfPossibleAssignments (List< Variable > vars)

#### 5.45.1 Detailed Description

This class implements various static methods useful when indexing arrays of distributions involving multinomial variables.

**Author** 

Antonio Fernández

Version

1.0

Since

2014-11-4

#### 5.45.2 Member Function Documentation

5.45.2.1 static int eu.amidst.core.utils.MultinomialIndex.getIndexFromVariableAssignment ( List< Variable > vars, Assignment assignment ) [static]

Computes the order of an assignment when indexing the set of possible values for a set of multinomial variables.

Example: Let X, Y and Z three multinomial variables with states {0,1}, {0,1} and {0,1,2} respectively. Then, they are indexed as:

```
X Y Z Index

0 0 0 0 0

1 0 0 1

0 1 0 2

1 1 0 3

0 0 1 4

1 0 1 5

0 1 1 6

1 1 1 7

0 0 2 8

1 0 2 9

0 1 2 10

1 1 2 11
```

So, for instance Index(0,0,2) = 8.

#### **Parameters**

vars	A List of variables.
assignment	A Assignment for a set of variables.

#### Returns

The index of the corresponding assignment among the possible ones.

5.45.2.2 static int eu.amidst.core.utils.MultinomialIndex.getIndexFromVariableAssignment ( List< Variable > vars, List< Double > assignment ) [static]

Computes the order of an assignment when indexing the set of possible values for a set of multinomial variables.

#### **Parameters**

vars	A List of variables.
assignment	A List of double values for the variables in the same order.

#### Returns

The index of the corresponding assignment among the possible ones.

5.45.2.3 static int eu.amidst.core.utils.MultinomialIndex.getIndexFromVariableAssignment ( List< Variable > vars, double[] assignment ) [static]

Computes the order of an assignment when indexing the set of possible values for a set of multinomial variables.

#### **Parameters**

vars	A List of variables.
assignment	An array of double with the values of variables in the same order.

#### Returns

The index of the corresponding assignment among the possible ones.

Computes the number of possible assignments for a list of variables

## **Parameters**

vare	The List of variables.
Vais	The List of variables.

#### Returns

A integer indicating the number of possible assignments.

5.45.2.5 static double [] eu.amidst.core.utils.MultinomialIndex.getVariableAssignmentFromIndex ( List< Variable > vars, int index ) [static]

Computes the variable assignment located in a given position.

#### **Parameters**

vars	A List of variables.
index	The position of the Assignment.

#### Returns

An array of double with the values of the variables representing the assignment.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/utils/MultinomialIndex.java

## 5.46 eu.amidst.core.potential.MultivariateGaussian Class Reference

**Public Member Functions** 

- double density (double[] values)
- void setMean (double[] values)
- double getMean ()
- void setCovariances (double[][] values)
- double[][] getCovariances ()
- double[] sample ()

## 5.46.1 Detailed Description

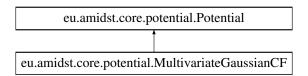
Created by afa on 03/07/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/potential/MultivariateGaussian.java

## 5.47 eu.amidst.core.potential.MultivariateGaussianCF Class Reference

Inheritance diagram for eu.amidst.core.potential.MultivariateGaussianCF:



## **Public Member Functions**

- void setParameters (MultivariateGaussian prob)
- double[][] getKParameter ()
- double[] getHParameter ()
- double getGParameter ()
- MultivariateGaussian getMG ()
- · void setVariables (List variables)
- List getVariables ()
- void combine (Potential pot)
- void marginalize (List variables)

## 5.47.1 Detailed Description

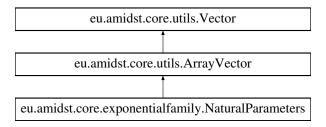
Created by afa on 03/07/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/potential/MultivariateGaussianCF.java

## 5.48 eu.amidst.core.exponentialfamily.NaturalParameters Class Reference

Inheritance diagram for eu.amidst.core.exponentialfamily.NaturalParameters:



#### **Public Member Functions**

- NaturalParameters (int size)
- NaturalParameters (double[] vec)

## **Additional Inherited Members**

#### 5.48.1 Detailed Description

Created by andresmasegosa on 12/11/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/exponentialfamily/NaturalParameters.java

## 5.49 eu.amidst.core.database.filereaders.NextDynamicDataInstance Class Reference

**Public Member Functions** 

- NextDynamicDataInstance (DataRow past, DataRow present, int sequenceID, int timeIDcounter)
- DynamicDataInstance nextDataInstance\_NoTimeID\_NoSeq (DataFileReader reader)
- DynamicDataInstance nextDataInstance\_NoSeq (DataFileReader reader, Attribute attTimeID)
- DynamicDataInstance nextDataInstance NoTimeID (DataFileReader reader, Attribute attSequenceID)

## 5.49.1 Detailed Description

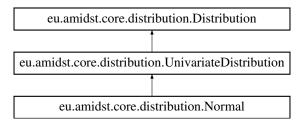
Created by ana@cs.aau.dk on 13/11/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/database/filereaders/NextDynamicDataInstance.
 —
 java

## 5.50 eu.amidst.core.distribution.Normal Class Reference

Inheritance diagram for eu.amidst.core.distribution.Normal:



## **Public Member Functions**

- · Normal (Variable var)
- double getMean ()
- void setMean (double mean)
- double getSd ()
- void setSd (double sd)
- double getProbability (double value)
- double getLogProbability (double value)

#### **Additional Inherited Members**

## 5.50.1 Detailed Description

This class implements a univariate Normal distribution.

Author

Antonio Fernández

Version

1.0

Since

2014-11-3

## 5.50.2 Constructor & Destructor Documentation

5.50.2.1 eu.amidst.core.distribution.Normal.Normal ( Variable var )

The class constructor.

#### **Parameters**

var The variable of the distribution.

## 5.50.3 Member Function Documentation

5.50.3.1 double eu.amidst.core.distribution.Normal.getLogProbability ( double value )

Computes the logarithm of the density function in a given point.

**Parameters** 

value An value for the variable.

#### Returns

A double with the logarithm of the density value.

5.50.3.2 double eu.amidst.core.distribution.Normal.getMean ( )

Gets the mean of the distribution.

#### Returns

A double value with the mean.

5.50.3.3 double eu.amidst.core.distribution.Normal.getProbability ( double value )

Evaluates the density function in a given point.

**Parameters** 

value An value for the variable.

#### Returns

A double with the value of the density.

5.50.3.4 double eu.amidst.core.distribution.Normal.getSd ( )

Gets the standard deviation of the distribution.

#### Returns

A double value with the standar deviation.

5.50.3.5 void eu.amidst.core.distribution.Normal.setMean ( double mean )

Sets the mean of the distribution.

#### **Parameters**

mean	A value for the mean.

5.50.3.6 void eu.amidst.core.distribution.Normal.setSd ( double sd )

Sets the standard deviation of the distribution.

#### **Parameters**

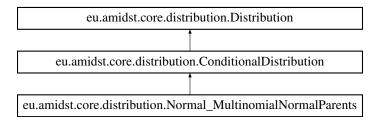
sd	A value for the standard deviation.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/distribution/Normal.java

## 5.51 eu.amidst.core.distribution.Normal\_MultinomialNormalParents Class Reference

Inheritance diagram for eu.amidst.core.distribution.Normal\_MultinomialNormalParents:



#### **Public Member Functions**

- Normal\_MultinomialNormalParents (Variable var, List< Variable > parents)
- · Normal\_NormalParents getNormal\_NormalParentsDistribution (Assignment assignment)
- Normal\_NormalParents getNormal\_NormalParentsDistribution (int i)
- void setNormal\_NormalParentsDistribution (int position, Normal\_NormalParents distribution)
- void setNormal NormalParentsDistribution (Assignment assignment, Normal NormalParents distribution)
- double getLogConditionalProbability (Assignment assignment)
- List< Variable > getMultinomialParents ()
- List< Variable > getNormalParents ()
- Normal\_NormalParents[] getDistribution ()

#### **Additional Inherited Members**

#### 5.51.1 Detailed Description

This class implements a conditional distribution of a normal variable given a set of multinomial and normal parents.

Author

Antonio Fernández

Version

1.0

Since

2014-11-4

#### 5.51.2 Constructor & Destructor Documentation

5.51.2.1 eu.amidst.core.distribution.Normal\_MultinomialNormalParents.Normal\_MultinomialNormalParents ( Variable *var*, List< Variable > *parents* )

The class constructor.

#### **Parameters**

var	The variable of the distribution.
parents	The set of parent variables.

#### 5.51.3 Member Function Documentation

5.51.3.1 double eu.amidst.core.distribution.Normal\_MultinomialNormalParents.getLogConditionalProbability ( Assignment assignment )

Computes the logarithm of the evaluated density function in a point after restricting the distribution to a given parent Assignment.

#### **Parameters**

assignment	An Assignment

#### Returns

A double with the logarithm of the corresponding density value.

5.51.3.2 Normal\_NormalParents eu.amidst.core.distribution.Normal\_MultinomialNormalParents.getNormal\_Normal ← ParentsDistribution (Assignment assignment)

Gets a  $Normal_NormalParentsDistribution$  distribution conditioned to an assignment over a set of Multinomial parents. Let X and Y two sets of Normal variables, and Z a set of Multinomial. Then this method computes f(X|Y,Z=z).

## **Parameters**

assignment	An assignment over a set of parents. For generality reasons, apart from the Multinomial
	parents, the assignment contains values for the Normal parents as well (although they are
	not used in this case).

#### Returns

a Normal\_NormalParentsDistribution distribution conditioned to the assignment given as argument.

5.51.3.3 void eu.amidst.core.distribution.Normal\_MultinomialNormalParents.setNormal\_NormalParentsDistribution (int position, Normal\_NormalParents distribution)

Sets a Normal\_NormalParents distribution to a given position in the array of distributions.

#### **Parameters**

position	The position in which the distribution is set.
distribution	A Normal_NormalParents distribution.

## 5.51.3.4 void eu.amidst.core.distribution.Normal\_MultinomialNormalParents.setNormal\_NormalParentsDistribution ( Assignment assignment, Normal NormalParents distribution )

Sets a Normal\_NormalParents distribution to the array of distributions in a position determined by an given Assignment. Note that this assignment contains values for the Normal parents as well (although they are not used in this case).

#### **Parameters**

assignment	An Assignment for the parents variables.
distribution	A Normal_NormalParents distribution.

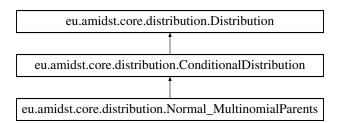
The documentation for this class was generated from the following file:

/Users/ana/Documents/core/src/main/java/eu/amidst/core/distribution/Normal\_MultinomialNormalParents.

 java

## 5.52 eu.amidst.core.distribution.Normal MultinomialParents Class Reference

Inheritance diagram for eu.amidst.core.distribution.Normal\_MultinomialParents:



#### **Public Member Functions**

- Normal\_MultinomialParents (Variable var, List< Variable > parents)
- Normal getNormal (int position)
- · Normal getNormal (Assignment parentsAssignment)
- void setNormal (int position, Normal normalDistribution)
- void setNormal (Assignment parentsAssignment, Normal normalDistribution)
- double getLogConditionalProbability (Assignment assignment)

#### **Additional Inherited Members**

## 5.52.1 Detailed Description

This class implements a conditional distribution of a normal variable given a set of multinomial parents.

**Author** 

Antonio Fernández

Version

1.0

Since

2014-11-4

## 5.52.2 Constructor & Destructor Documentation

5.52.2.1 eu.amidst.core.distribution.Normal\_MultinomialParents.Normal\_MultinomialParents ( Variable var, List< Variable > parents )

The class constructor.

#### **Parameters**

var	The variable of the distribution.
parents	The set of parent variables.

## 5.52.3 Member Function Documentation

5.52.3.1 double eu.amidst.core.distribution.Normal\_MultinomialParents.getLogConditionalProbability ( Assignment assignment )

Computes the logarithm of the evaluated density function in a point after conditioning the distribution to a given parent Assignment.

**Parameters** 

assignment	An Assignment for the parents.

#### Returns

A double with the logarithm of the corresponding density value.

5.52.3.2 Normal eu.amidst.core.distribution.Normal\_MultinomialParents.getNormal ( Assignment parentsAssignment )

Gets the corresponding univariate normal distribution after conditioning the distribution to a multinomial parent assignment.

**Parameters** 

parents⇔	An Assignment for the parents.
Assignment	

#### Returns

A Normal object with the univariate distribution.

5.52.3.3 void eu.amidst.core.distribution.Normal\_MultinomialParents.setNormal ( int position, Normal normalDistribution )

Sets a Normal distribution in a given position in the array of distributions.

#### **Parameters**

position	The position in which the distribution is set.
normal⇔	The Normal distribution to be set.
Distribution	

## 5.52.3.4 void eu.amidst.core.distribution.Normal\_MultinomialParents.setNormal ( Assignment parentsAssignment, Normal normalDistribution )

Sets a Multinomial distribution in a position in the array of distributions determined by a given parents assignment.

#### **Parameters**

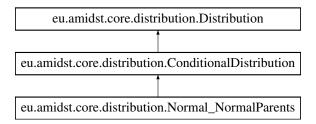
parents⇔	An Assignment for the parents.
Assignment	
normal⇔	The Normal distribution to be set.
Distribution	

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/distribution/Normal MultinomialParents.java

## 5.53 eu.amidst.core.distribution.Normal NormalParents Class Reference

Inheritance diagram for eu.amidst.core.distribution.Normal\_NormalParents:



#### **Public Member Functions**

- Normal\_NormalParents (Variable var, List< Variable > parents)
- double getIntercept ()
- void setIntercept (double intercept)
- double[] getCoeffParents ()
- void setCoeffParents (double[] coeffParents)
- double getSd ()
- void setSd (double sd)
- Normal getUnivariateNormal (Assignment parentsAssignment)
- double getLogConditionalProbability (Assignment assignment)

#### **Additional Inherited Members**

## 5.53.1 Detailed Description

This class implements a Conditional Linear Gaussian distribution, i.e. a distribution of a normal variable with continuous normal parents.

Author

Antonio Fernández

Version

1.0

Since

2014-11-4

#### 5.53.2 Constructor & Destructor Documentation

5.53.2.1 eu.amidst.core.distribution.Normal\_NormalParents.Normal\_NormalParents ( Variable *var,* List< Variable > parents )

The class constructor.

#### **Parameters**

var	The variable of the distribution.
parents	The set of parents of the variable.

## 5.53.3 Member Function Documentation

5.53.3.1 double [] eu.amidst.core.distribution.Normal\_NormalParents.getCoeffParents ( )

Gets the coefficients for the parent variables.

Returns

An array of double with the coefficients.

5.53.3.2 double eu.amidst.core.distribution.Normal\_NormalParents.getIntercept ( )

Gets the intercept of the distribution.

Returns

A double value with the intercept.

5.53.3.3 double eu.amidst.core.distribution.Normal\_NormalParents.getLogConditionalProbability ( Assignment assignment )

Computes the logarithm of the evaluated density function in a point after conditioning the distribution to a given parent Assignment.

#### **Parameters**

assignment	An Assignment

#### Returns

A double with the logarithm of the corresponding density value.

5.53.3.4 double eu.amidst.core.distribution.Normal\_NormalParents.getSd ( )

Gets the standard deviation of the variable.

Returns

A double value with the standard deviation.

5.53.3.5 Normal eu.amidst.core.distribution.Normal\_NormalParents.getUnivariateNormal ( Assignment parentsAssignment )

Gets the corresponding univariate normal distribution after conditioning the distribution to a parent assignment.

#### **Parameters**

parents⇔	An Assignment for the parents.
Assignment	

#### Returns

A Normal object with the univariate distribution.

5.53.3.6 void eu.amidst.core.distribution.Normal\_NormalParents.setCoeffParents ( double[] coeffParents )

Sets the coefficients of the distribution

#### **Parameters**

coeffParents	An array of double with the coefficients, one for each parent.
--------------	--

5.53.3.7 void eu.amidst.core.distribution.Normal\_NormalParents.setIntercept ( double intercept )

Sets the intercept of the distribution.

#### **Parameters**

intercept	A double value with the intercept.

5.53.3.8 void eu.amidst.core.distribution.Normal\_NormalParents.setSd ( double sd )

Sets the standard deviation of the variable.

## Parameters

sd	A double value with the standard deviation.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/distribution/Normal\_NormalParents.java

## 5.54 eu.amidst.core.huginlink.Others Class Reference

## 5.54.1 Detailed Description

Created by afa on 18/11/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/huginlink/Others.java

## 5.55 eu.amidst.core.modelstructure.ParentSet Class Reference

#### **Public Member Functions**

- void addParent (Variable var)
- void removeParent (Variable var)
- List< Variable > getParents ()
- int getNumberOfParents ()
- void blockParents ()

#### **Static Public Member Functions**

static ParentSet newParentSet ()

#### 5.55.1 Detailed Description

Created by afa on 02/07/14.

#### 5.55.2 Member Function Documentation

#### 5.55.2.1 void eu.amidst.core.modelstructure.ParentSet.blockParents ( )

Is an ArrayList pointer to an ArrayList unmodifiable object still unmodifiable? I guess so right?

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/modelstructure/ParentSet.java

## 5.56 eu.amidst.core.potential.Potential Interface Reference

Inheritance diagram for eu.amidst.core.potential.Potential:



#### **Public Member Functions**

- · void setVariables (List variables)
- List getVariables ()
- void combine (Potential pot)
- void marginalize (List variables)

## 5.56.1 Detailed Description

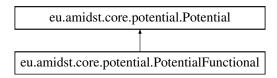
Created by afa on 03/07/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/potential/Potential.java

## 5.57 eu.amidst.core.potential.PotentialFunctional Class Reference

Inheritance diagram for eu.amidst.core.potential.PotentialFunctional:



#### **Public Member Functions**

- · void setVariables (List variables)
- List getVariables ()
- void combine (Potential pot)
- void marginalize (List variables)

## 5.57.1 Detailed Description

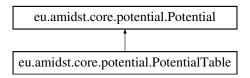
Created by afa on 03/07/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/potential/PotentialFunctional.java

## 5.58 eu.amidst.core.potential.PotentialTable Class Reference

Inheritance diagram for eu.amidst.core.potential.PotentialTable:



## **Public Member Functions**

- PotentialTable (int nstates)
- void setValues (double[] values)
- double[] getValues ()
- void setVariables (List variables)
- List getVariables ()
- void combine (Potential pot)
- void marginalize (List variables)
- void normalize ()

## 5.58.1 Detailed Description

Created by afa on 03/07/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/potential/PotentialTable.java

## 5.59 eu.amidst.core.database.dynamics.SequenceDataStream Interface Reference

#### **Public Member Functions**

- Attributes getDynamicAttributes ()
- int getNumTimeStepsBack ()
- boolean hasMoreData ()
- DynamicDataInstance nextSequenceData ()
- void reset ()
- boolean isReseteable ()

## 5.59.1 Detailed Description

Created by afa on 03/07/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/database/dynamics/SequenceDataStream.java

## 5.60 eu.amidst.core.database.dynamics.readers.SequenceDataStreamReaderFromFile Class Reference

#### **Public Member Functions**

- SequenceDataStreamReaderFromFile (String fileName)
- SequenceDataStream getDataStream ()

## 5.60.1 Detailed Description

Created by andresmasegosa on 27/08/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/database/dynamics/readers/SequenceData
 StreamReaderFromFile.java

## 5.61 eu.amidst.core.database.dynamics.SequenceStreamWindow Interface Reference

#### **Public Member Functions**

- Attributes getDynamicAttributes ()
- int getWindowSize ()
- boolean hasMoreData ()
- void loadNextWindow ()
- DynamicDataInstance getSequenceData (int indexInWindow)
- boolean isReseteable ()
- void reset ()

## 5.61.1 Detailed Description

Created by afa on 03/07/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/database/dynamics/SequenceStreamWindow.java

## 5.62 eu.amidst.core.variables.StateSpaceType Enum Reference

**Static Public Member Functions** 

• static StateSpaceType parseKind (String s)

**Public Attributes** 

• REAL

#### 5.62.1 Detailed Description

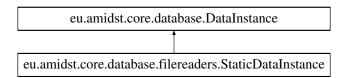
Created by sigveh on 10/20/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/variables/StateSpaceType.java

## 5.63 eu.amidst.core.database.filereaders.StaticDataInstance Class Reference

Inheritance diagram for eu.amidst.core.database.filereaders.StaticDataInstance:



## **Public Member Functions**

- StaticDataInstance (DataRow dataRow\_)
- double getValue (Variable var)
- int getSequenceID ()
- int getTimeID ()

## 5.63.1 Detailed Description

Created by andresmasegosa on 11/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/database/filereaders/StaticDataInstance.java

## 5.64 eu.amidst.core.database.filereaders.StaticDataOnDiskFromFile Class Reference

Inheritance diagram for eu.amidst.core.database.filereaders.StaticDataOnDiskFromFile:



#### **Public Member Functions**

- StaticDataOnDiskFromFile (DataFileReader reader)
- DataInstance nextDataInstance ()
- boolean hasMoreDataInstances ()
- Attributes getAttributes ()
- · void restart ()

#### 5.64.1 Detailed Description

Created by andresmasegosa on 11/11/14.

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

## 5.65 eu.amidst.core.database.filereaders.StaticDataOnMemoryFromFile Class Reference

Inheritance diagram for eu.amidst.core.database.filereaders.StaticDataOnMemoryFromFile:



## **Public Member Functions**

- StaticDataOnMemoryFromFile (DataFileReader reader)
- int getNumberOfDataInstances ()
- DataInstance getDataInstance (int i)
- DataInstance nextDataInstance ()
- boolean hasMoreDataInstances ()
- void restart ()
- Attributes getAttributes ()

#### 5.65.1 Detailed Description

Created by andresmasegosa on 11/11/14.

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

#### 5.66 eu.amidst.core.variables.StaticVariables Class Reference

## **Public Member Functions**

- · StaticVariables (Attributes atts)
- StaticVariables (Attributes atts, HashMap< Attribute, DistType > typeDists)
- Variable addHiddenVariable (VariableBuilder builder)
- List< Variable > getVariables ()
- Variable getVariable (int varID)
- Variable getVariable (String name)
- int getNumberOfVars ()

## 5.66.1 Detailed Description

Created by afa on 02/07/14.

#### 5.66.2 Constructor & Destructor Documentation

5.66.2.1 eu.amidst.core.variables.StaticVariables.StaticVariables ( Attributes atts )

Constructor where the distribution type of random variables is initialized by default.

5.66.2.2 eu.amidst.core.variables.StaticVariables.StaticVariables ( Attributes atts, HashMap< Attribute, DistType > typeDists )

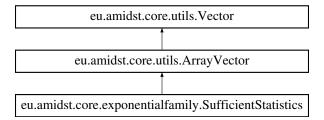
Constructor where the distribution type of random variables is provided as an argument.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/variables/StaticVariables.java

## 5.67 eu.amidst.core.exponentialfamily.SufficientStatistics Class Reference

Inheritance diagram for eu.amidst.core.exponentialfamily.SufficientStatistics:



## **Public Member Functions**

- SufficientStatistics (int size)
- SufficientStatistics (double[] vec)

#### **Additional Inherited Members**

## 5.67.1 Detailed Description

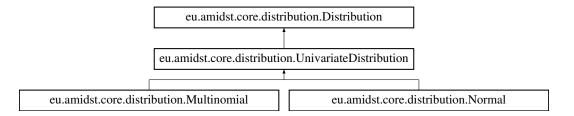
Created by andresmasegosa on 12/11/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/exponentialfamily/SufficientStatistics.java

## 5.68 eu.amidst.core.distribution.UnivariateDistribution Class Reference

Inheritance diagram for eu.amidst.core.distribution.UnivariateDistribution:



#### **Public Member Functions**

- double getProbability (double value)
- abstract double getLogProbability (double value)

#### **Additional Inherited Members**

## 5.68.1 Detailed Description

This interface generalizes the set of univariate distributions.

**Author** 

Antonio Fernández

Version

1.0

Since

2014-11-3

#### 5.68.2 Member Function Documentation

5.68.2.1 abstract double eu.amidst.core.distribution.UnivariateDistribution.getLogProbability ( double *value* ) [abstract]

Evaluates the distribution in a given point.

#### **Parameters**

value	The point to be evaluated.
-------	----------------------------

#### Returns

A double value with the logarithm of the evaluated distribution.

5.68.2.2 double eu.amidst.core.distribution.UnivariateDistribution.getProbability ( double value )

Evaluates the distribution in a given point.

#### **Parameters**

value	The point to be evaluated.
-------	----------------------------

#### Returns

A double value with the evaluated distribution.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/distribution/UnivariateDistribution.java

## 5.69 eu.amidst.core.utils.Utils Class Reference

**Static Public Member Functions** 

- static double getMissingValue ()
- static boolean isMissing (double val)
- static void accumulatedSumVectors (double[] a, double[] b)

## 5.69.1 Detailed Description

Created by andresmasegosa on 28/08/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/utils/Utils.java

## 5.70 eu.amidst.core.variables.Variable Interface Reference

**Public Member Functions** 

- String getName ()
- int getVarID ()
- boolean isObservable ()
- int getNumberOfStates ()
- StateSpaceType getStateSpaceType ()
- DistType getDistributionType ()
- boolean isTemporalClone ()
- Attribute getAttribute ()

## 5.70.1 Detailed Description

Created by afa on 02/07/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/variables/Variable.java

#### 5.71 eu.amidst.core.variables.VariableBuilder Class Reference

**Public Member Functions** 

- VariableBuilder (Attribute att)
- VariableBuilder (Attribute att, DistType typeDist)

#### **Static Public Member Functions**

- static String getName ()
- static boolean isObservable ()
- static int getNumberOfStates ()
- static StateSpaceType getStateSpaceType ()
- static DistType getDistributionType ()
- static Attribute getAttribute ()

## 5.71.1 Detailed Description

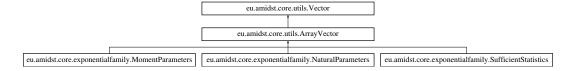
Created by andresmasegosa on 04/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/variables/VariableBuilder.java

## 5.72 eu.amidst.core.utils.Vector Interface Reference

Inheritance diagram for eu.amidst.core.utils.Vector:



#### **Public Member Functions**

- double **get** (int i)
- void set (int i, double val)
- int size ()
- · default void dotProduct (Vector vec)

#### **Static Public Member Functions**

static double dotProduct (Vector vec1, Vector vec2)

## 5.72.1 Detailed Description

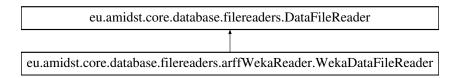
Created by andresmasegosa on 12/11/14.

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

• /Users/ana/Documents/core/src/main/java/eu/amidst/core/utils/Vector.java

# 5.73 eu.amidst.core.database.filereaders.arffWekaReader.WekaDataFileReader Class Reference

Inheritance diagram for eu.amidst.core.database.filereaders.arffWekaReader.WekaDataFileReader:



#### **Public Member Functions**

- WekaDataFileReader (String s)
- Attributes getAttributes ()
- DataRow nextDataRow ()
- boolean hasMoreDataRows ()
- void reset ()
- boolean doesItReadThisFileExtension (String fileExtension)

## 5.73.1 Detailed Description

Created by ana@cs.aau.dk on 14/11/14.

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

/Users/ana/Documents/core/src/main/java/eu/amidst/core/database/filereaders/arffWekaReader/Weka

 DataFileReader.java