GoSUM core

3.0

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Namespace for GoSUM model.

Chapter 6

Class Documentation

6.1 GoSUM::CAnalyticalModel Class Reference

Class for analytical representation of the model.

`#include <AnalyticalModel.h>`

Public Types

- enum svmtype { epsilonsvr, nusvr }

Public Member Functions

- CAnalyticalModel (CInputParameters ∗_pIP, COutputStates ∗_pOS)
- virtual ∼CAnalyticalModel ()
- void setSvmType (svmtype _etype)

  Sets chosen svm type.
- svmtype svmType () const

  Returns chosen svm type.
- bool empty () const

  Returns true if object is empty, true otherwise.
- void clear ()

  Clears data.
- void learn (CMADS &_mads, std::ostream &_out=std::cout)

  Learns SVM models for all output states.
- void setInputSamples (const std::vector< ArrayXd > &_X)

  Sets internal input parameter samples.
- const std::vector< ArrayXd > & inputSamples ()

  Returns internal input parameter samples.
- const std::vector< ArrayXd > & outputSamples ()

  Returns internal output state samples.
- void predict ()

  Computes predicted values on internal input/output samples.
- double predictValue (const ArrayXd &_X, int i) const

  Predicts value of the ith (expanded) output state, _X must be unexpanded.
- ArrayXd predictDerivative (const ArrayXd &_X, int i) const

  Predicts gradient of the ith (expanded) output state, _X must be unexpanded.
- ArrayXd predictValues (const ArrayXd &_X) const

Predicts values of all output states, _X must be unexpanded.
- ArrayXXd predictDerivatives (const ArrayXd &_X) const

  Predicts gradients of all (expanded) output states, _X must be unexpanded.
- ArrayXd exportExpectedCurve (const ArrayXd &_x, int _i, int _o) const

  Exports _o output vs. _i input curve, while other inputs are set to their expected values.
- ArrayXd exportIntersectionCurve (int _s, const ArrayXd &_x, int _i, int _o) const

  Exports _o output vs. _i input curve, while other inputs are set to values in _x.
- void setProgressSlot (boost::function< void()> _progressSlot)

  Sets external progress slot.

Public Attributes

- boost::function< void()> progressSlot

  External progress slot, later connected to signal for optimization progress.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- CAnalyticalModel ()

Private Attributes

- svmtype etype

  Holds chosen analytical model type.
- CInputParameters * pIP

  Points to input parameters.
- COutputStates * pOS

  Points to output states.
- boost::ptr_vector< CSingleAM > sam

  Holds pointers to snigle output state analytical models.
- std::vector< ArrayXd > X
- std::vector< ArrayXd > Y

Friends

- class boost::serialization::access

  Boost serialization.

6.1.1 Detailed Description

Class for analytical representation of the model.

6.1.2 Member Enumeration Documentation

6.1.2.1 enum GoSUM::CAnalyticalModel::svmtype

Enumerator:

epsilonsvr

nusvr

6.1.3 Constructor & Destructor Documentation

6.1.3.1 GoSUM::CAnalyticalModel::CAnalyticalModel ( ) `[inline]`, `[private]`

6.1.3.2 GoSUM::CAnalyticalModel::CAnalyticalModel (**CInputParameters** * *_pIP*, **COutputStates** * *_pOS*) `[inline]`

6.1.3.3 virtual GoSUM::CAnalyticalModel::∼CAnalyticalModel ( ) `[inline]`, `[virtual]`

6.1.4 Member Function Documentation

6.1.4.1 void GoSUM::CAnalyticalModel::clear ( ) `[inline]`

Clears data.

6.1.4.2 bool GoSUM::CAnalyticalModel::empty ( ) const `[inline]`

Returns true if object is empty, true otherwise.

6.1.4.3 ArrayXd GoSUM::CAnalyticalModel::exportExpectedCurve (const ArrayXd & *_x*, int *_i*, int *_o*) const

Exports _o output vs. _i input curve, while other inputs are set to their expected values.

6.1.4.4 ArrayXd GoSUM::CAnalyticalModel::exportIntersectionCurve (int *_s*, const ArrayXd & *_x*, int *_i*, int *_o*) const

Exports _o output vs. _i input curve, while other inputs are set to values in _x.

6.1.4.5 const std::vector<ArrayXd>& GoSUM::CAnalyticalModel::inputSamples ( ) `[inline]`

Returns internal input parameter samples.

6.1.4.6 void GoSUM::CAnalyticalModel::learn (**CMADS** & *_mads*, std::ostream & *_out* = `std::cout`)

Learns SVM models for all output states.

6.1.4.7 const std::vector<ArrayXd>& GoSUM::CAnalyticalModel::outputSamples ( ) `[inline]`

Returns internal output state samples.

6.1.4.8 void GoSUM::CAnalyticalModel::predict ( )

Computes predicted values on internal input/output samples.

6.1.4.9 ArrayXd GoSUM::CAnalyticalModel::predictDerivative (const ArrayXd & *_X*, int *i*) const

Predicts gradient of the ith (expanded) output state, _X must be unexpanded.

6.1.4.10 ArrayXXd GoSUM::CAnalyticalModel::predictDerivatives (const ArrayXd & *_X*) const

Predicts gradients of all (expanded) output states, _X must be unexpanded.

6.1.4.11 double GoSUM::CAnalyticalModel::predictValue (const ArrayXd & *_X,* int *i*) const

Predicts value of the ith (expanded) output state, _X must be unexpanded.

6.1.4.12 ArrayXd GoSUM::CAnalyticalModel::predictValues (const ArrayXd & *_X*) const

Predicts values of all output states, _X must be unexpanded.

6.1.4.13 template<class Archive > void GoSUM::CAnalyticalModel::serialize (Archive & *ar,* const unsigned int *version*) `[private]`

6.1.4.14 void GoSUM::CAnalyticalModel::setInputSamples (const std::vector< ArrayXd > & *_X*) `[inline]`

Sets internal input parameter samples.

6.1.4.15 void GoSUM::CAnalyticalModel::setProgressSlot (boost::function< void()> *_progressSlot*) `[inline]`

Sets external progress slot.

6.1.4.16 void GoSUM::CAnalyticalModel::setSvmType (svmtype *_etype*) `[inline]`

Sets chosen svm type.

6.1.4.17 svmtype GoSUM::CAnalyticalModel::svmType ( ) const `[inline]`

Returns chosen svm type.

6.1.5 Friends And Related Function Documentation

6.1.5.1 friend class boost::serialization::access `[friend]`

Boost serialization.

6.1.6 Member Data Documentation

6.1.6.1 svmtype GoSUM::CAnalyticalModel::etype `[private]`

Holds chosen analytical model type.

6.1.6.2 CInputParameters* GoSUM::CAnalyticalModel::pIP `[private]`

Points to input parameters.

6.1.6.3 COutputStates* GoSUM::CAnalyticalModel::pOS `[private]`

Points to output states.

6.1.6.4 boost::function<void()> GoSUM::CAnalyticalModel::progressSlot

External progress slot, later connected to signal for optimization progress.

6.1.6.5 boost::ptr_vector< CSingleAM > GoSUM::CAnalyticalModel::sam [private]

Holds pointers to snigle output state analytical models.

6.1.6.6 std::vector< ArrayXd > GoSUM::CAnalyticalModel::X [private]

6.1.6.7 std::vector< ArrayXd > GoSUM::CAnalyticalModel::Y [private]

Input parameter and output state samples for prediction.

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

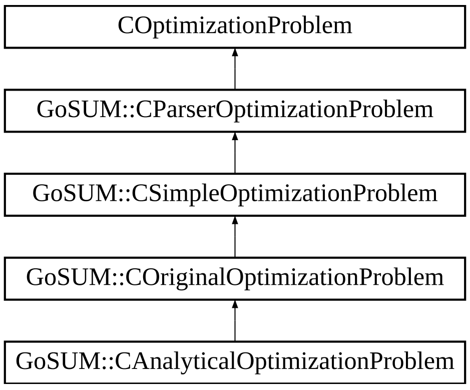
- C:/Development/core/AnalyticalModel.h
- C:/Development/core/AnalyticalModel.cpp

6.2 GoSUM::CAnalyticalOptimizationProblem Class Reference

Class for the optimization problem based on GoSUM analyitical model.

`#include <ParserOptimizationProblem.h>`

Inheritance diagram for GoSUM::CAnalyticalOptimizationProblem:


COptimizationProblem
GoSUM::CParserOptimizationProblem
GoSUM::CSimpleOptimizationProblem
GoSUM::COriginalOptimizationProblem
GoSUM::CAnalyticalOptimizationProblem

Public Member Functions

- CAnalyticalOptimizationProblem (CInputParameters ∗_pIP, COutputStates ∗_pOS, CAnalyticalModel ∗_pA-M)
- virtual ∼CAnalyticalOptimizationProblem ()
- ArrayXd inputPoint2ModelPoint (const ArrayXd &_ip)

    Converts input parameter point to model point.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- CAnalyticalOptimizationProblem ()

Protected Attributes

- CAnalyticalModel ∗ pAM

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.2.1 Detailed Description

Class for the optimization problem based on GoSUM analyitical model.

6.2.2 Constructor & Destructor Documentation

6.2.2.1 GoSUM::CAnalyticalOptimizationProblem::CAnalyticalOptimizationProblem ( ) [inline], [protected]

6.2.2.2 GoSUM::CAnalyticalOptimizationProblem::CAnalyticalOptimizationProblem (**CInputParameters** $*$ *_pIP,* **COutputStates** $*$ *_pOS,* **CAnalyticalModel** $*$ *_pAM*) [inline]

6.2.2.3 virtual GoSUM::CAnalyticalOptimizationProblem::∼CAnalyticalOptimizationProblem ( ) [inline], [virtual]

6.2.3 Member Function Documentation

6.2.3.1 ArrayXd GoSUM::CAnalyticalOptimizationProblem::inputPoint2ModelPoint (const ArrayXd & *_ip*)

Converts input parameter point to model point.

Reimplemented from GoSUM::COriginalOptimizationProblem.

6.2.3.2 template<class Archive > void GoSUM::CAnalyticalOptimizationProblem::serialize (Archive & *ar,* const unsigned int *version*) [protected]

Reimplemented from GoSUM::COriginalOptimizationProblem.

6.2.4 Friends And Related Function Documentation

6.2.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.2.5 Member Data Documentation

6.2.5.1 CAnalyticalModel$*$ GoSUM::CAnalyticalOptimizationProblem::pAM [protected]

Points to analytical model.

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

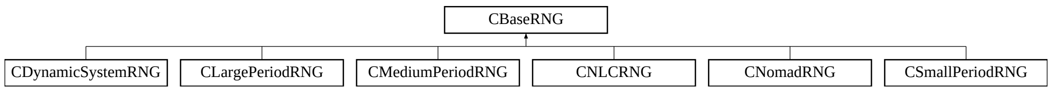
- C:/Development/core/ParserOptimizationProblem.h
- C:/Development/core/ParserOptimizationProblem.cpp

6.3 CBaseRNG Class Reference

Abstract base class for all uniform random number generators (RNG).

`#include <RandomGenerators.h>`

Inheritance diagram for CBaseRNG:



Public Member Functions

- virtual void setSeed (unsigned int s)=0

  Sets seed of the RNG.
- virtual unsigned int rndi ()=0

  Returns randomly generated unsigned int.
- virtual double rnd ()=0

  Returns randomly generated double between 0 and 1.
- virtual double rnd (double a, double b)

  Returns randomly generated double between a and b.

6.3.1 Detailed Description

Abstract base class for all uniform random number generators (RNG).

6.3.2 Member Function Documentation

6.3.2.1 virtual double CBaseRNG::rnd ( ) `[pure virtual]`

Returns randomly generated double between 0 and 1.

Implemented in CNomadRNG, CNLCRNG, CMediumPeriodRNG, CSmallPeriodRNG, CDynamicSystemRNG, and CLargePeriodRNG.

6.3.2.2 virtual double CBaseRNG::rnd (double *a*, double *b*) `[inline], [virtual]`

Returns randomly generated double between a and b.

6.3.2.3 virtual unsigned int CBaseRNG::rndi ( ) `[pure virtual]`

Returns randomly generated unsigned int.

Implemented in CNomadRNG, CNLCRNG, CMediumPeriodRNG, CSmallPeriodRNG, CDynamicSystemRNG, and CLargePeriodRNG.

6.3.2.4 virtual void CBaseRNG::setSeed (unsigned int *s*) `[pure virtual]`

Sets seed of the RNG.

Implemented in CNomadRNG, CNLCRNG, CMediumPeriodRNG, CSmallPeriodRNG, CDynamicSystemRNG, and CLargePeriodRNG.

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

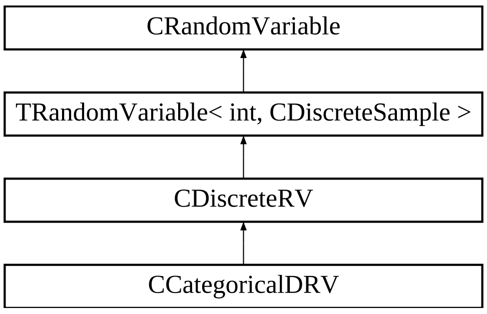
- C:/Development/core/RandomGenerators.h

6.4 CCategoricalDRV Class Reference

Class for categorical discrete random variables derived from discrete random variables.

`#include <RandomVariable.h>`

Inheritance diagram for CCategoricalDRV:



Public Member Functions

- CCategoricalDRV ()
- virtual ∼CCategoricalDRV ()
- CCategoricalDRV (const CCategoricalDRV &O)
- virtual void setDistribution (const CDiscreteSample &_aS)

  Computes PMF and CDF from sample histogram.
- virtual double probability (int _k) const

  Function that returns PMF.
- virtual double cumulative (int _k) const

  Function that returns CDF.
- virtual int expandedSize () const
- virtual double minValue () const

  After expansion, number of new variables is equal to the number of categories.
- virtual double maxValue () const

  Returns maximal value of the random variable.
- virtual double expectedValue () const

  Returns expected value of the random variable.
- virtual distributiontype distributionType () const

  Returns enum type of the random variable distribution.
- virtual std::string distributionName () const

  Returns name of the random variable distribution.
- virtual ArrayXi exportDomain () const

  Exports domain of the random variable.
- virtual bool isDistributionDefined () const

  Returns true if distribution is defined, false otherwise.
- virtual double variance () const

  Returns variance of the random variable.

Protected Member Functions

- virtual double doQuantile (double _p) const

  Quantile, formula implementation.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- ArrayXd p
- ArrayXd cdf

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.4.1 Detailed Description

Class for categorical discrete random variables derived from discrete random variables.

6.4.2 Constructor & Destructor Documentation

6.4.2.1 CCategoricalDRV::CCategoricalDRV ( ) `[inline]`

6.4.2.2 virtual CCategoricalDRV::∼CCategoricalDRV ( ) `[inline], [virtual]`

6.4.2.3 CCategoricalDRV::CCategoricalDRV (const **CCategoricalDRV** & *O*) `[inline]`

6.4.3 Member Function Documentation

6.4.3.1 virtual double CCategoricalDRV::cumulative (int *_k*) const `[inline], [virtual]`

Function that returns CDF.

6.4.3.2 virtual std::string CCategoricalDRV::distributionName ( ) const `[inline], [virtual]`

Returns name of the random variable distribution.

Implements CRandomVariable.

6.4.3.3 virtual **distributiontype** CCategoricalDRV::distributionType ( ) const `[inline], [virtual]`

Returns enum type of the random variable distribution.

Implements CRandomVariable.

6.4.3.4 double CCategoricalDRV::doQuantile (double _p) const [protected], [virtual]

Quantile, formula implementation.

Implements CRandomVariable.

6.4.3.5 virtual int CCategoricalDRV::expandedSize ( ) const [inline], [virtual]

Reimplemented from CRandomVariable.

6.4.3.6 virtual double CCategoricalDRV::expectedValue ( ) const [inline], [virtual]

Returns expected value of the random variable.

Implements CRandomVariable.

6.4.3.7 ArrayXi CCategoricalDRV::exportDomain ( ) const [virtual]

Exports domain of the random variable.

Implements TRandomVariable< t, T >.

6.4.3.8 virtual bool CCategoricalDRV::isDistributionDefined ( ) const [inline], [virtual]

Returns true if distribution is defined, false otherwise.

Reimplemented from CRandomVariable.

6.4.3.9 virtual double CCategoricalDRV::maxValue ( ) const [inline], [virtual]

Returns maximal value of the random variable.

Implements CRandomVariable.

6.4.3.10 virtual double CCategoricalDRV::minValue ( ) const [inline], [virtual]

After expansion, number of new variables is equal to the number of categories.

Returns minimal value of the random variable.

Implements CRandomVariable.

6.4.3.11 virtual double CCategoricalDRV::probability (int _k) const [inline], [virtual]

Function that returns PMF.

6.4.3.12 template< class Archive > void CCategoricalDRV::serialize (Archive & *ar*, const unsigned int *version*) [private]

6.4.3.13 void CCategoricalDRV::setDistribution (const CDiscreteSample & _aS) [virtual]

Computes PMF and CDF from sample histogram.

6.4.3.14 virtual double CCategoricalDRV::variance ( ) const [inline], [virtual]

Returns variance of the random variable.

Implements CRandomVariable.

6.4.4 Friends And Related Function Documentation

6.4.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.4.5 Member Data Documentation

6.4.5.1 ArrayXd CCategoricalDRV::cdf [private]

PMF (p) and CDF (cdf) data.

6.4.5.2 ArrayXd CCategoricalDRV::p [private]

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

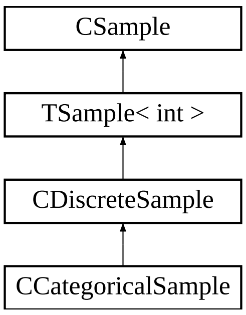
- C:/Development/core/RandomVariable.h
- C:/Development/core/RandomVariable.cpp

6.5 CCategoricalSample Class Reference

Abstract class for categorical discrete samples.

`#include <Sample.h>`

Inheritance diagram for CCategoricalSample:



Public Member Functions

- CCategoricalSample ()
- CCategoricalSample (const CCategoricalSample &O)
- virtual ~CCategoricalSample ()
- virtual void readSampleValue (std::ifstream &_ifs, int _at)

  Reads particular sample data from input file stream.
- virtual void writeSampleValue (std::ofstream &_ofs, int _at) const

  < Writes particular sample data to output file stream.

- virtual void setSampleSize (int _n)

  Sets particular sample data value.
- int minValue () const

  Returns minimal sample data value.
- int maxValue () const

  Returns maximal sample data value.
- virtual double variance () const

  Returns sample variance (i.e.empirical).

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- std::vector< std::string > categories

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.5.1 Detailed Description

Abstract class for categorical discrete samples.

6.5.2 Constructor & Destructor Documentation

6.5.2.1 CCategoricalSample::CCategoricalSample ( ) `[inline]`

6.5.2.2 CCategoricalSample::CCategoricalSample (const CCategoricalSample & *O*) `[inline]`

6.5.2.3 virtual CCategoricalSample::∼CCategoricalSample ( ) `[inline], [virtual]`

6.5.3 Member Function Documentation

6.5.3.1 int CCategoricalSample::maxValue ( ) const `[inline]`

Returns maximal sample data value.

Reimplemented from TSample< t >.

6.5.3.2 int CCategoricalSample::minValue ( ) const `[inline]`

Returns minimal sample data value.

Reimplemented from TSample< t >.

6.5.3.3 void CCategoricalSample::readSampleValue (std::ifstream & _ifs, int _at) `[virtual]`

Reads particular sample data from input file stream.

Reimplemented from TSample< t >.

6.5.3.4 template<class Archive > void CCategoricalSample::serialize (Archive & ar, const unsigned int *version*) `[private]`

6.5.3.5 virtual void CCategoricalSample::setSampleSize (int _n) `[inline]`, `[virtual]`

Sets particular sample data value.

Reimplemented from TSample< t >.

6.5.3.6 virtual double CCategoricalSample::variance ( ) const `[inline]`, `[virtual]`

Returns sample variance (i.e.empirical).

Reimplemented from CDiscreteSample.

6.5.3.7 virtual void CCategoricalSample::writeSampleValue (std::ofstream & _ofs, int _at) const `[inline]`, `[virtual]`

< Writes particular sample data to output file stream.

Reimplemented from TSample< t >.

6.5.4 Friends And Related Function Documentation

6.5.4.1 friend class boost::serialization::access `[friend]`

Boost serialization.

6.5.5 Member Data Documentation

6.5.5.1 std::vector<std::string> CCategoricalSample::categories `[private]`

Holds all category values.

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

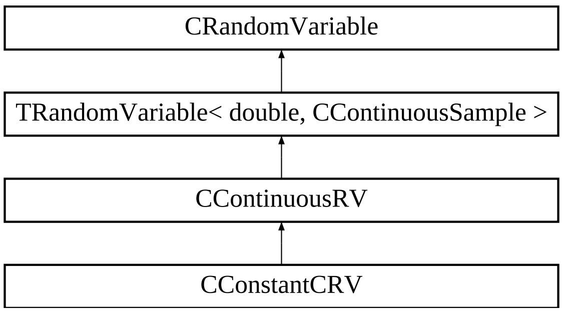
- C:/Development/core/Sample.h
- C:/Development/core/Sample.cpp

6.6 CConstantCRV Class Reference

Class for constant continuous random variables derived from continuous random variables.

`#include <RandomVariable.h>`

Inheritance diagram for CConstantCRV:



Public Member Functions

- CConstantCRV ()
- virtual ∼CConstantCRV ()
- CConstantCRV (const CConstantCRV &O)
- virtual void setDistribution (double _xc, double _dp2=0)

    Set distribution parameter.
- virtual void setDistribution (const CContinuousSample &_aS)

    Set distribution parameters from sample empirical parameters.
- virtual double probability (double _x) const

    Function that returns PMF.
- virtual double cumulative (double _x) const

    Function that returns CDF.
- virtual double minValue () const

    Returns minimal value of the random variable.
- virtual double maxValue () const

    Returns maximal value of the random variable.
- virtual double expectedValue () const

    Returns expected value of the random variable.
- virtual distributiontype distributionType () const

    Returns enum type of the random variable distribution.
- virtual std::string distributionName () const

    Returns name of the random variable distribution.
- virtual ArrayXd exportDomain () const

    Exports domain of the random variable.
- double constantValue () const

    Returns value of constant random variable.
- void setConstantValue (double _xc)

    Sets value of constant random variable.
- virtual double variance () const

    Returns variance of the random variable.

Protected Member Functions

- virtual double doQuantile (double _p) const

    Quantile, formula implementation.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- double xc

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.6.1 Detailed Description

Class for constant continuous random variables derived from continuous random variables.

6.6.2 Constructor & Destructor Documentation

6.6.2.1 CConstantCRV::CConstantCRV ( ) `[inline]`

6.6.2.2 virtual CConstantCRV::∼CConstantCRV ( ) `[inline], [virtual]`

6.6.2.3 CConstantCRV::CConstantCRV (const CConstantCRV & *O*) `[inline]`

6.6.3 Member Function Documentation

6.6.3.1 double CConstantCRV::constantValue ( ) const `[inline]`

Returns value of constant random variable.

6.6.3.2 virtual double CConstantCRV::cumulative (double *_x*) const `[inline], [virtual]`

Function that returns CDF.

6.6.3.3 virtual std::string CConstantCRV::distributionName ( ) const `[inline], [virtual]`

Returns name of the random variable distribution.

Implements CRandomVariable.

6.6.3.4 virtual distributiontype CConstantCRV::distributionType ( ) const `[inline], [virtual]`

Returns enum type of the random variable distribution.

Implements CRandomVariable.

6.6.3.5 virtual double CConstantCRV::doQuantile (double *_p*) const `[inline], [protected], [virtual]`

Quantile, formula implementation.

Implements CRandomVariable.

6.6.3.6 virtual double CConstantCRV::expectedValue ( ) const [inline], [virtual]

Returns expected value of the random variable.

Implements CRandomVariable.

6.6.3.7 ArrayXd CConstantCRV::exportDomain ( ) const [virtual]

Exports domain of the random variable.

Implements TRandomVariable< t, T >.

6.6.3.8 virtual double CConstantCRV::maxValue ( ) const [inline], [virtual]

Returns maximal value of the random variable.

Implements CRandomVariable.

6.6.3.9 virtual double CConstantCRV::minValue ( ) const [inline], [virtual]

Returns minimal value of the random variable.

Implements CRandomVariable.

6.6.3.10 virtual double CConstantCRV::probability (double _x) const [inline], [virtual]

Function that returns PMF.

6.6.3.11 template< class Archive > void CConstantCRV::serialize (Archive & *ar*, const unsigned int *version*) [private]

6.6.3.12 void CConstantCRV::setConstantValue (double _xc) [inline]

Sets value of constant random variable.

6.6.3.13 void CConstantCRV::setDistribution (double _xc, double _dp2 = 0) [virtual]

Set distribution parameter.

6.6.3.14 virtual void CConstantCRV::setDistribution (const CContinuousSample & _aS) [inline], [virtual]

Set distribution parameters from sample empirical parameters.

6.6.3.15 virtual double CConstantCRV::variance ( ) const [inline], [virtual]

Returns variance of the random variable.

Implements CRandomVariable.

6.6.4 Friends And Related Function Documentation

6.6.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.6.5 Member Data Documentation

6.6.5.1 double CConstantCRV::xc `[private]`

Distribution parameter: constant integer value of the random varialbe.

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

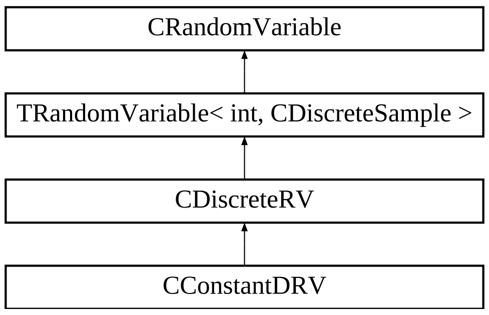
- C:/Development/core/RandomVariable.h
- C:/Development/core/RandomVariable.cpp

6.7 CConstantDRV Class Reference

Class for constant discrete random variables derived from discrete random variables.

`#include <RandomVariable.h>`

Inheritance diagram for CConstantDRV:



Public Member Functions

- CConstantDRV ()
- virtual ∼CConstantDRV ()
- CConstantDRV (const CConstantDRV &O)
- virtual void setDistribution (int _c, int _dp2=0)

  Set distribution parameter.
- virtual void setDistribution (const CDiscreteSample &_aS)

  Computes PMF and CDF from sample histogram.
- virtual double probability (int _k) const

  Function that returns PMF.
- virtual double cumulative (int _k) const

  Function that returns CDF.
- virtual double minValue () const

  Returns minimal value of the random variable.
- virtual double maxValue () const

  Returns maximal value of the random variable.
- virtual double expectedValue () const

  Returns expected value of the random variable.
- virtual distributiontype distributionType () const

  Returns enum type of the random variable distribution.
- virtual std::string distributionName () const

  Returns name of the random variable distribution.
- virtual ArrayXi exportDomain () const

Exports domain of the random variable.

- int constantValue () const

  Returns value of constant random variable.
- void setConstantValue (int _c)

  Sets value of constant random variable.
- virtual double variance () const

  Returns variance of the random variable.

Protected Member Functions

- virtual double doQuantile (double _p) const

  Quantile, formula implementation.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- int c

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.7.1 Detailed Description

Class for constant discrete random variables derived from discrete random variables.

6.7.2 Constructor & Destructor Documentation

6.7.2.1 CConstantDRV::CConstantDRV ( ) [inline]

6.7.2.2 virtual CConstantDRV::∼CConstantDRV ( ) [inline], [virtual]

6.7.2.3 CConstantDRV::CConstantDRV (const CConstantDRV & *O*) [inline]

6.7.3 Member Function Documentation

6.7.3.1 int CConstantDRV::constantValue ( ) const [inline]

Returns value of constant random variable.

6.7.3.2 virtual double CConstantDRV::cumulative (int *_k*) const [inline], [virtual]

Function that returns CDF.

6.7.3.3 virtual std::string CConstantDRV::distributionName ( ) const [inline], [virtual]

Returns name of the random variable distribution.

Implements CRandomVariable.

6.7.3.4 virtual distributiontype CConstantDRV::distributionType ( ) const [inline], [virtual]

Returns enum type of the random variable distribution.

Implements CRandomVariable.

6.7.3.5 virtual double CConstantDRV::doQuantile (double *_p*) const [inline], [protected], [virtual]

Quantile, formula implementation.

Implements CRandomVariable.

6.7.3.6 virtual double CConstantDRV::expectedValue ( ) const [inline], [virtual]

Returns expected value of the random variable.

Implements CRandomVariable.

6.7.3.7 ArrayXi CConstantDRV::exportDomain ( ) const [virtual]

Exports domain of the random variable.

Implements TRandomVariable< t, T >.

6.7.3.8 virtual double CConstantDRV::maxValue ( ) const [inline], [virtual]

Returns maximal value of the random variable.

Implements CRandomVariable.

6.7.3.9 virtual double CConstantDRV::minValue ( ) const [inline], [virtual]

Returns minimal value of the random variable.

Implements CRandomVariable.

6.7.3.10 virtual double CConstantDRV::probability (int *_k*) const [inline], [virtual]

Function that returns PMF.

6.7.3.11 template<class Archive > void CConstantDRV::serialize (Archive & *ar*, const unsigned int *version*) [private]

6.7.3.12 void CConstantDRV::setConstantValue (int *_c*) [inline]

Sets value of constant random variable.

6.7.3.13 void CConstantDRV::setDistribution (int *_c*, int *_dp2* = 0) [virtual]

Set distribution parameter.

6.7.3.14 virtual void CConstantDRV::setDistribution (const CDiscreteSample & _aS) [inline], [virtual]

Computes PMF and CDF from sample histogram.

6.7.3.15 virtual double CConstantDRV::variance ( ) const [inline], [virtual]

Returns variance of the random variable.

Implements CRandomVariable.

6.7.4 Friends And Related Function Documentation

6.7.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.7.5 Member Data Documentation

6.7.5.1 int CConstantDRV::c [private]

Distribution parameter: constant integer value of the random variable.

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

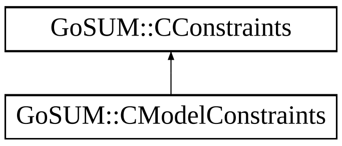
- C:/Development/core/RandomVariable.h
- C:/Development/core/RandomVariable.cpp

6.8 GoSUM::CConstraints Class Reference

Class for the constraints with parser functions.

`#include <Constraints.h>`

Inheritance diagram for GoSUM::CConstraints:



Public Member Functions

- CConstraints ()
- virtual ∼CConstraints ()
- virtual void clear ()

    Clears object.
- int size () const

    Returns size of the constraints.
- void addExpression (const std::string &_gexpr)

    Adds contraint expression.
- void eraseExpression (int _at)

    Erases particular constraint expression.

- void setExpression (const std::string &_gexpr, int _at)

    Sets particular cosntraint expression.
- std::string expression (int _at) const

    Returns particular constraint expression.
- std::string roundoffEquality (std::string _expr)

    If _expr is an equality expression left=right it returns expression abs(left-right)<=TINY.
- bool validateExpressions ()

    Validates all expressions.
- void parseExpressions ()

    Parses all expressions.
- double evaluate (const ArrayXd &_x, int _at)

    Evalautes particular constraint value from variables values.
- bool constraintsSatisfied (const ArrayXd &_x)

    Returns true if _x satisfies constraints, false otherwise.
- bool findInExpressions (const std::string &_name) const

    Returns true if _name is found in constraint expressions, false otherwise.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- virtual void setVariableNames ()=0

    Sets variable names for the parser.

Protected Attributes

- std::string names

    Holds all names that are permited in objective and constraint expressions.
- std::vector< std::string > gexpr

    Holds expressions for constraints.
- FunctionParser f

    Holds base function parser.
- std::vector< FunctionParser > g

Friends

- class boost::serialization::access

    Boost serialization.

6.8.1 Detailed Description

Class for the constraints with parser functions.

6.8.2 Constructor & Destructor Documentation

6.8.2.1 GoSUM::CConstraints::CConstraints ( ) [inline]

6.8.2.2 virtual GoSUM::CConstraints::∼CConstraints ( ) [inline], [virtual]

6.8.3 Member Function Documentation

6.8.3.1 void GoSUM::CConstraints::addExpression (const std::string & *_gexpr*) [inline]

Adds contraint expression.

6.8.3.2 virtual void GoSUM::CConstraints::clear ( ) [inline], [virtual]

Clears object.

Reimplemented in GoSUM::CModelConstraints.

6.8.3.3 bool GoSUM::CConstraints::constraintsSatisfied (const ArrayXd & *_x*)

Returns true if _x satisfies constraints, false otherwise.

6.8.3.4 void GoSUM::CConstraints::eraseExpression (int *_at*)

Erases particular constraint expression.

6.8.3.5 double GoSUM::CConstraints::evaluate (const ArrayXd & *_x,* int *_at*) [inline]

Evalautes particular constraint value from variables values.

6.8.3.6 std::string GoSUM::CConstraints::expression (int *_at*) const [inline]

Returns particular constraint expression.

6.8.3.7 bool GoSUM::CConstraints::findInExpressions (const std::string & *_name*) const

Returns true if _name is found in constraint expressions, false otherwise.

6.8.3.8 void GoSUM::CConstraints::parseExpressions ( )

Parses all expressions.

6.8.3.9 std::string GoSUM::CConstraints::roundoffEquality (std::string *_expr*)

If _expr is an equality expression left=right it returns expression abs(left-right)<=TINY.

6.8.3.10 template<class Archive > void GoSUM::CConstraints::serialize (Archive & *ar,* const unsigned int *version*) [protected]

Reimplemented in GoSUM::CModelConstraints.

6.8.3.11 void GoSUM::CConstraints::setExpression (const std::string & _gexpr, int _at)

Sets particular cosntraint expression.

6.8.3.12 virtual void GoSUM::CConstraints::setVariableNames ( ) `[protected]`, `[pure virtual]`

Sets variable names for the parser.

Implemented in GoSUM::CModelConstraints.

6.8.3.13 int GoSUM::CConstraints::size ( ) const `[inline]`

Returns size of the constraints.

6.8.3.14 bool GoSUM::CConstraints::validateExpressions ( )

Validates all expressions.

6.8.4 Friends And Related Function Documentation

6.8.4.1 friend class boost::serialization::access `[friend]`

Boost serialization.

6.8.5 Member Data Documentation

6.8.5.1 FunctionParser GoSUM::CConstraints::f `[protected]`

Holds base function parser.

6.8.5.2 std::vector<FunctionParser> GoSUM::CConstraints::g `[protected]`

Holds function parsers for constraints.

6.8.5.3 std::vector<std::string> GoSUM::CConstraints::gexpr `[protected]`

Holds expressions for constraints.

6.8.5.4 std::string GoSUM::CConstraints::names `[protected]`

Holds all names that are permited in objective and constraint expressions.

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

- C:/Development/core/Constraints.h
- C:/Development/core/Constraints.cpp

6.9 GoSUM::CContainer Class Reference

Class for the GoSUM main project.

```
#include <Container.h>
```

Public Types

- enum projecttype {
  samplegeneration, modelanalysis, dataanalysis, simpleoptimization,
  modeloptimization, learnedmodeloptimization, learneddataoptimization }
- enum optimizationmethodtype { mads, ga }

Public Member Functions

- CContainer ()
- virtual ∼CContainer ()
- void addDefaultVariable (CModelVariables ∗pMVs, CRandomVariable::distributiontype _dtype)

  Adds one model variable, input and output, with default distribution parameter values.
- void addVariable (CModelVariables ∗pMVs, CRandomVariable::distributiontype _dtype, double _a=0., double _b=0.)

  Adds one model variable, input and output.
- void addVariable (CModelVariables ∗pMVs, const std::string &_name, CRandomVariable::distributiontype _-dtype, double _a=0., double _b=0.)

  Adds one model variable, input and output.
- void eraseVariable (CModelVariables ∗pMVs, std::string _name)

  Erases model variable with _name.
- void cloneVariable (CModelVariables ∗pMVs, int _at)

  Clones particular model variable.
- void addVariables (CModelVariables ∗pMVs, int _N, CRandomVariable::distributiontype _dtype, double _a=0., double _b=0.)

  Adds multiple model variables, input and output.
- void addVariables (CModelVariables ∗pMVs, const std::string &_name, int _N, CRandomVariable-::distributiontype _dtype, double _a=0., double _b=0.)

  Adds multiple model variables, input and output.
- void addInput (const std::string &_name, CRandomVariable::distributiontype _type, double _a=0., double _-b=0.)

  Adds one input parameter.
- void addOutput (const std::string &_name, CRandomVariable::distributiontype _type, double _a=0., double _b=0.)

  Adds one output state.
- void addInputs (int _N, const std::string &_name, CRandomVariable::distributiontype _type, double _a=0., double _b=0.)

  Adds multiple input parameters.
- void addOutputs (int _N, const std::string &_name, CRandomVariable::distributiontype _type, double _a=0., double _b=0.)

  Adds multiple output states.
- void save ()

  Saves project to binary format.
- void load ()

  Loads project from binary format.
- void saveXml ()

  Saves project to xml format.
- void loadXml ()

  Loads project from xml format.
- void saveTxt ()

  Saves project to txt format.
- void loadTxt ()

Loads project from txt format.

- bool containsTheoreticalViarables (const std::string &_fname)

  Returns true if file _fname contains theoretical variables, false otherwise.
- bool containsNamedTheoreticalViarables (const std::string &_fname)

  Returns true if file _fname contains named theoretical variables, false otherwise.
- bool containsEmpiricalViarables (const std::string &_fname, int &SSize, std::vector< CRandomVariable::distributiontype > &dtypes)

  Returns true if file _fname contains empirical variables, false otherwise.
- bool containsNamedEmpiricalViarables (const std::string &_fname, int &SSize, std::vector< CRandomVariable::distributiontype > &dtypes)

  Returns true if file _fname contains named empirical variables, false otherwise.
- bool containsDeclaredEmpiricalViarables (const std::string &_fname, int &SSize, std::vector< CRandomVariable::distributiontype > &dtypes)

  Returns true if file _fname contains explicitly typed empirical variables, false otherwise.
- bool containsNamedDeclaredEmpiricalViarables (const std::string &_fname, int &SSize, std::vector< CRandomVariable::distributiontype > &dtypes)

  Returns true if file _fname contains named explicitly typed empirical variables, false otherwise.
- bool containsPredictionSamples (const std::string &_fname, int &Ncols, int &Nrows)

  Returns true if file _fname contains predicition samples, false otherwise.
- void importTheoreticalVariables (GoSUM::CModelVariables ∗pMVs, const std::string &_fname)

  Imports multiple theoretical model variables from a file.
- void importNamedTheoreticalVariables (GoSUM::CModelVariables ∗pMVs, const std::string &_fname)

  Imports multiple theoretical model variables from a file.
- void importEmpiricalVariables (GoSUM::CModelVariables ∗pMVs, const std::string &_fname, int &SSize, std::vector< CRandomVariable::distributiontype > &dtypes)

  Imports multiple empirical model variables from a file.
- void importNamedEmpiricalVariables (GoSUM::CModelVariables ∗pMVs, const std::string &_fname, int &SSize, std::vector< CRandomVariable::distributiontype > &dtypes)

  Imports multiple empirical model variables from a file.
- void importDeclaredEmpiricalVariables (GoSUM::CModelVariables ∗pMVs, const std::string &_fname, int &SSize, std::vector< CRandomVariable::distributiontype > &dtypes)

  Imports multiple empirical model variables from a file.
- void importNamedDeclaredEmpiricalVariables (GoSUM::CModelVariables ∗pMVs, const std::string &_fname, int &SSize, std::vector< CRandomVariable::distributiontype > &dtypes)

  Imports multiple empirical model variables from a file.
- void importVariables (GoSUM::CModelVariables ∗pMVs, const std::string &_fname)

  Imports multiple model variables from a file, input and output.
- void exportSamples (CModelVariables ∗pMVs, const std::string &_fname)

  Exports samples for model variables, input and output.
- void importInputs (const std::string &_fname)

  Imports multiple input parameters.
- void importOutputs (const std::string &_fname)

  Imports multiple output states.
- void exportInputSamples (const std::string &_fname)

  Imports input samples from file.
- void exportOutputSamples (const std::string &_fname)

  Imports output samples from file.
- bool importPredictionInputSamples (const std::string &_fname)

  Imports prediction input samples.
- void exportPredictionOutputSamples (const std::string &_fname)

  Exports prediction output samples.
- void exportDerivativeSensitivity (const std::string &_fname)

Exports derivative sensitivity.

- void exportAverageDerivative (const std::string &_fname)

  Exports average derivative sensitivity.
- void exportAbsoluteAverageDerivative (const std::string &_fname)

  Exports absolute average derivative sensitivity.
- void exportVarianceSensitivity (const std::string &_fname)

  Exports variance sensitivity.
- void exportFirstOrderANOVA (const std::string &_fname)

  Exports first order ANOVA sensitivity.
- void exportOptimizationMethod (const std::string &_fname)

  Exports optimization method.
- void exportOptimizationHistory (const std::string &_fname)

  Exports optimization history.
- void importModelConstraints (const std::string &_fname)

  Imports model constraint expressions.
- void importOptimizationConstraints (const std::string &_fname)

  Imports optimization constraint expressions.
- void importLowerBound (const std::string &_fname)

  Imports lower bounds for optimization variables.
- void importUpperBound (const std::string &_fname)

  Imports upper bounds for optimization variables.
- void importInitialValue (const std::string &_fname)

  Imports inital values for optimization variables.
- void resampleInputs ()

  Resamples input parameters.
- void evaluateOutputs ()

  Evaluates output states using external executable.
- void learnModel ()

  Learns model.
- void predict ()

  Predicts (using analytical model).
- void predictMean (ArrayXd &ymu, ArrayXd &yvar)

  Predicts mean and variance using learned model.
- void computeSensitivities ()

  Computes sensitivities.
- void optimize ()

  Optimizes.
- void reduce ()

  Reduces model.
- void minimize ()

  Minimizes.
- void maximize ()

  Maximizes.
- void clear ()

  Clears all project content.
- void clearResults ()

  Clears all project results.
- void clearForReducing ()

  Clears all results except reducer.
- void clearSamplingResults (CModelVariables ∗_pMVs)

  Clears project results starting from particular sampling.

- void clearLearningResults ()

  Clears project results, starting from learning.
- void clearSensitivityResults ()

  Clears project results, starting from senstivity.
- void clearOptimizationResults ()

  Clears optimization results.
- bool emptyResults () const

  Returns true if results are empty, false otherwise.
- bool emptySamplingResults (CModelVariables ∗_pMVs) const

  Returns true if results starting from the _pMVs sampling are empty, false otherwise.
- bool emptyLearningResults () const

  Returns true if learning results are empty, false otherwise.
- bool emptySensitivityResults () const

  Returns true if sensitivity results are empty, false otherwise.
- bool emptyOptimizationResults () const

  Returns true if optimization results are empty, false otherwise.
- bool emptySelectedSamples () const

  Returns true if selected samples are empty, false otherwise.
- void setProjectPath (const std::string &_prjPath)

  Sets project path.
- std::string projectPath ()

  Returns project path.
- void setProjectName (const std::string &_prjName)

  Sets project name.
- std::string projectName ()

  Returns project name.
- std::string longProjectName ()

  Returns long project name.
- void setProjectType (projecttype _prjType)

  Sets chosen project type.
- projecttype projectType ()

  Returns chosen project type.
- void setOptimizationMethod (optimizationmethodtype _omType)

  Sets chosen optimization method type.
- optimizationmethodtype optimizationMethod ()

  Returns chosen optimization method type.
- int learnEvaluationSize ()

  Returns maximal number of learn optimization evaluations.
- void setThreadSize (int _trdN)

  Sets chosen thread size.
- void setMatLabPath (const std::string &_matlabPath)

  Sets MatLab path.
- void setRNG (CRandomGenerator::rngtype _type)

  Sets chosen rng type.
- void setResampleType (CHypercube::hctype _type)

  Sets resample type.
- void setResampleSize (int _N)

  Sets resample size.
- void setVoronoiOptions (int _maxiter, int _q, double _alpha2, double _beta2)

  Sets Voronoi options.
- void setModelEvaluator (GoSUM::CModelEvaluator::evaluatortype _me, const std::string &_filename)

    Sets model evaluator.
- void setSensitivityOptions (int _N, double _eps1=0.005, double _eps2=0.01, double _eps3=0.01)

    Sets sensitivity parameters.
- void setReductionType (GoSUM::CReduction::reductiontype _rtype)

    Sets model reduction type.
- void setReductionOutputs (const std::vector< std::string > &_selOS)

    Sets reduction outputs.
- void setReductionCutoffSize (int _cutip)

    Sets reduction inputs cutoff size.
- void setReductionCutoffValue (double _cutval)

    Sets reduction inputs cut value.
- void resetOptimizationVariable (CModelVariables ∗pMVs, int _at)

    Resets values in the particular optimization variable.
- void setObjective (const std::string &_fexpr)

    Sets objective of the optimization problem.
- void addOptimizationConstraint (const std::string &_gexpr)

    Adds constraint of the optimization problem.
- void setLowerBound (const ArrayXd &_xL)

    Sets lower bound of the optimization variables.
- void setUpperBound (const ArrayXd &_xU)

    Sets upper bound of the optimization variables.
- void setInitialValue (const ArrayXd &_x0)

    Sets initial value of the optimization variables.
- void setMadsMaxEvaluation (int _maxeval)

    Sets MADS maximal number of evaluations.
- void setMadsLHSearch (int _lh0, int _lhi)

    Sets MADS lh search paraemters.
- void setMadsInitMeshSize (double _ims)

    Sets MADS initial mesh size.
- void setMadsMinPollSize (double _mps)

    Sets MADS final poll size.
- bool isSampleSelected (int _i) const

    Returns true if particular sample value is selected, false otherwise.
- void selectSamples (CModelVariable ∗pmv, double _left, double _right)

    Selects sample values of variable pmv that are contained in [_left,_right] interval.
- void separateBySelection (const ArrayXd &X, std::vector< double > &x, std::vector< double > &selx) const

    Separates array X into two vectors based on the index (not contained/contained in selected samples).
- void eraseSelectedSamples ()

    Erases selected sample values in all model variables.
- int inputsSize ()

    Returns input parameters size.
- int outputsSize ()

    Returns output states size.
- CInputParameters & inputParameters ()

    Returns input parameters.
- CModelConstraints & modelConstraints ()

    Returns model constraints.
- CHypercube & hyperCube ()

    Returns hypercube.
- CModelVariable & inputParameter (int _at)

    Returns particular input parameter.

- CModelVariable & outputState (int _at)

  Returns particular output state.
- COutputStates & outputStates ()

  Returns output states.
- CEvaluator & modelEvaluator ()

  Returns evaluator.
- CAnalyticalModel & analyticalModel ()

  Returns analytical model.
- CSensitivityAnalysis & sensitivityAnalysis ()

  Returns sensitivity analysis.
- CReduction & reducer ()

  Returns reduction tool.
- CSimpleOptimizationProblem $*$ optimizationProblem ()

  Returns optimization problem.
- CMADS & madsOptimizer ()

  Returns MADS.
- CGAModelOptimization & gaOptimizer ()

  Returns MADS.
- std::vector$<$ int $>$ & selectedSamples ()
- bool readyToSampleInputs ()

  Returns true if project is ready to sample inputs, false otherwise.
- bool readyToEvaluateOutputs ()

  Returns true if project is ready to evaluate outputs, false otherwise.
- bool readyToLearnModel ()

  Returns true if project is ready to learn model, false otherwise.
- bool readyToComputeSensitivities ()

  Returns true if project is ready to compute sensitivities, false otherwise.
- bool readyToReduceModel ()

  Returns true if project is ready to reduce model, false otherwise.
- bool readyToSetOptimization ()

  Returns true if project is ready to set optimization, false otherwise.
- bool readyToOptimize ()

  Returns true if project is ready to optimize, false otherwise.
- void startResampling ()

  Starts sampling inputs.
- void startEvaluating ()

  Starts evaluating outputs.
- void startLearning ()

  Starts learning model.
- void startSensitivityComputing ()

  Starts sensitivity computing.
- void startOptimizing ()

  Starts optimizing.
- void join ()

  Joins thread for computation.
- int optimizationStepsSize () const

  Returns maximal number of optimization evaluations.
- int learningStepsSize () const

  Returns learning steps size.

Static Public Member Functions

- static projecttype ProjectType (const std::string &_stype)

  Converts project type name (string) to projecttype enumerator-.
- static optimizationmethodtype OptimizationMethodType (const std::string &_stype)

  Converts optimization method name (string) to optimizationmethodtype enumerator.

Public Attributes

- boost::thread thrd

  Thread for computations.
- boost::signal< void()> resamplingFinished

  Signal for sampling inputs finshed.
- boost::signal< void()> evaluatingFinished

  Signal for evaluating outputs finshed.
- boost::signal< void()> learningFinished

  Signal for learning model finshed.
- boost::signal< void()> sensitivityComputingFinished

  Signal for sensitivity computing finshed.
- boost::signal< void()> optimizingFinished

  Signal for optimizing finshed.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- std::string prjPath
- std::string prjName

  Project path and name.
- projecttype prjType

  Project type.
- optimizationmethodtype omType

  Optimization method type.
- CHypercube hycube

  Basic hypercube, used for resampling.
- CModelConstraints inconsts

  Model constraints, i.e. constraints on input paramters.
- CInputParameters inputs

  Input parameters of the project.
- COutputStates outputs

  Output states of the project.
- CEvaluator evaluator

  Basic evalautor of the project, used only for model based projects.
- CAnalyticalModel analytical

  Analytic model of the project.
- CSensitivityAnalysis sensitivity

  Sensistivity analysis of the analytical model.

- CReduction reduced

  Reduction operator.
- CSimpleOptimizationProblem $*$ pOP

  Defined optimization problem.
- CMADS MADS

  Mesh Adaptive Direct Search optimization method.
- CGAModelOptimization GAMO

  Genetic Algorithms optimization method.
- std::vector< int > selectedsamples

Friends

- class boost::serialization::access

  Boost serialization.

6.9.1 Detailed Description

Class for the GoSUM main project.

6.9.2 Member Enumeration Documentation

6.9.2.1 enum GoSUM::CContainer::optimizationmethodtype

Enumerator:

mads

ga

6.9.2.2 enum GoSUM::CContainer::projecttype

Enumerator:

samplegeneration

modelanalysis

dataanalysis

simpleoptimization

modeloptimization

learnedmodeloptimization

learneddataoptimization

6.9.3 Constructor & Destructor Documentation

6.9.3.1 GoSUM::CContainer::CContainer ( )

6.9.3.2 GoSUM::CContainer::∼CContainer ( ) [virtual]

6.9.4 Member Function Documentation

6.9.4.1 void GoSUM::CContainer::addDefaultVariable (GoSUM::CModelVariables $*$ *pMVs*, CRandomVariable::distributiontype *_dtype*)

Adds one model variable, input and output, with default distribution parameter values.

6.9.4.2 void GoSUM::CContainer::addInput (const std::string & *_name,* **CRandomVariable::distributiontype** *_type,* double *_a* = 0., double *_b* = 0.) [inline]

Adds one input parameter.

6.9.4.3 void GoSUM::CContainer::addInputs (int *_N,* const std::string & *_name,* **CRandomVariable::distributiontype** *_type,* double *_a* = 0., double *_b* = 0.) [inline]

Adds multiple input parameters.

6.9.4.4 void GoSUM::CContainer::addOptimizationConstraint (const std::string & *_gexpr*)

Adds constraint of the optimization problem.

6.9.4.5 void GoSUM::CContainer::addOutput (const std::string & *_name,* **CRandomVariable::distributiontype** *_type,* double *_a* = 0., double *_b* = 0.) [inline]

Adds one output state.

6.9.4.6 void GoSUM::CContainer::addOutputs (int *_N,* const std::string & *_name,* **CRandomVariable::distributiontype** *_type,* double *_a* = 0., double *_b* = 0.) [inline]

Adds multiple output states.

6.9.4.7 void GoSUM::CContainer::addVariable (**GoSUM::CModelVariables** * *pMVs,* **CRandomVariable::distributiontype** *_dtype,* double *_a* = 0., double *_b* = 0.)

Adds one model variable, input and output.

6.9.4.8 void GoSUM::CContainer::addVariable (**GoSUM::CModelVariables** * *pMVs,* const std::string & *_name,* **CRandomVariable::distributiontype** *_dtype,* double *_a* = 0., double *_b* = 0.)

Adds one model variable, input and output.

6.9.4.9 void GoSUM::CContainer::addVariables (**GoSUM::CModelVariables** * *pMVs,* int *_N,* **CRandomVariable::distributiontype** *_dtype,* double *_a* = 0., double *_b* = 0.)

Adds multiple model variables, input and output.

6.9.4.10 void GoSUM::CContainer::addVariables (**GoSUM::CModelVariables** * *pMVs,* const std::string & *_name,* int *_N,* **CRandomVariable::distributiontype** *_dtype,* double *_a* = 0., double *_b* = 0.)

Adds multiple model variables, input and output.

6.9.4.11 **CAnalyticalModel**& GoSUM::CContainer::analyticalModel ( ) [inline]

Returns analytical model.

6.9.4.12 void GoSUM::CContainer::clear ( )

Clears all project content.

6.9.4.13 void GoSUM::CContainer::clearForReducing ( )

Clears all results except reducer.

6.9.4.14 void GoSUM::CContainer::clearLearningResults ( )

Clears project results, starting from learning.

6.9.4.15 void GoSUM::CContainer::clearOptimizationResults ( )

Clears optimization results.

6.9.4.16 void GoSUM::CContainer::clearResults ( )

Clears all project results.

6.9.4.17 void GoSUM::CContainer::clearSamplingResults (CModelVariables ∗ *_pMVs*)

Clears project results starting from particular sampling.

6.9.4.18 void GoSUM::CContainer::clearSensitivityResults ( )

Clears project results, starting from senstivity.

6.9.4.19 void GoSUM::CContainer::cloneVariable (CModelVariables ∗ *pMVs,* int *_at*)

Clones particular model variable.

6.9.4.20 void GoSUM::CContainer::computeSensitivities ( )

Computes sensitivities.

6.9.4.21 bool GoSUM::CContainer::containsDeclaredEmpiricalViarables (const std::string & *_fname,* int & *SSize,* std::vector< CRandomVariable::distributiontype > & *dtypes*)

Returns true if file _fname contains explicitly typed empirical variables, false otherwise.

6.9.4.22 bool GoSUM::CContainer::containsEmpiricalViarables (const std::string & *_fname,* int & *SSize,* std::vector< CRandomVariable::distributiontype > & *dtypes*)

Returns true if file _fname contains empirical variables, false otherwise.

6.9.4.23 bool GoSUM::CContainer::containsNamedDeclaredEmpiricalViarables (const std::string & *_fname,* int & *SSize,* std::vector< CRandomVariable::distributiontype > & *dtypes*)

Returns true if file _fname contains named explicitly typed empirical variables, false otherwise.

6.9.4.24 bool GoSUM::CContainer::containsNamedEmpiricalViarables (const std::string & *_fname*, int & *SSize*, std::vector< CRandomVariable::distributiontype > & *dtypes*)

Returns true if file _fname contains named empirical variables, false otherwise.

6.9.4.25 bool GoSUM::CContainer::containsNamedTheoreticalViarables (const std::string & *_fname*)

Returns true if file _fname contains named theoretical variables, false otherwise.

6.9.4.26 bool GoSUM::CContainer::containsPredictionSamples (const std::string & *_fname*, int & *Ncols*, int & *Nrows*)

Returns true if file _fname contains predicition samples, false otherwise.

6.9.4.27 bool GoSUM::CContainer::containsTheoreticalViarables (const std::string & *_fname*)

Returns true if file _fname contains theoretical variables, false otherwise.

6.9.4.28 bool GoSUM::CContainer::emptyLearningResults ( ) const

Returns true if learning results are empty, false otherwise.

6.9.4.29 bool GoSUM::CContainer::emptyOptimizationResults ( ) const

Returns true if optimization results are empty, false otherwise.

6.9.4.30 bool GoSUM::CContainer::emptyResults ( ) const

Returns true if results are empty, false otherwise.

6.9.4.31 bool GoSUM::CContainer::emptySamplingResults (CModelVariables * *_pMVs*) const

Returns true if results starting from the _pMVs sampling are empty, false otherwise.

6.9.4.32 bool GoSUM::CContainer::emptySelectedSamples ( ) const [inline]

Returns true if selected samples are empty, false otherwise.

6.9.4.33 bool GoSUM::CContainer::emptySensitivityResults ( ) const

Returns true if sensitivity results are empty, false otherwise.

6.9.4.34 void GoSUM::CContainer::eraseSelectedSamples ( )

Erases selected sample values in all model variables.

6.9.4.35 void GoSUM::CContainer::eraseVariable (CModelVariables * *pMVs*, std::string *_name*)

Erases model variable with _name.

6.9.4.36 void GoSUM::CContainer::evaluateOutputs ( )

Evaluates output states using external executable.

6.9.4.37 void GoSUM::CContainer::exportAbsoluteAverageDerivative (const std::string & *_fname*)

Exports absolute average derivative sensitivity.

6.9.4.38 void GoSUM::CContainer::exportAverageDerivative (const std::string & *_fname*)

Exports average derivative sensitivity.

6.9.4.39 void GoSUM::CContainer::exportDerivativeSensitivity (const std::string & *_fname*)

Exports derivative sensitivity.

6.9.4.40 void GoSUM::CContainer::exportFirstOrderANOVA (const std::string & *_fname*)

Exports first order ANOVA sensitivity.

6.9.4.41 void GoSUM::CContainer::exportInputSamples (const std::string & *_fname*) `[inline]`

Imports input samples from file.

6.9.4.42 void GoSUM::CContainer::exportOptimizationHistory (const std::string & *_fname*)

Exports optimization history.

6.9.4.43 void GoSUM::CContainer::exportOptimizationMethod (const std::string & *_fname*)

Exports optimization method.

6.9.4.44 void GoSUM::CContainer::exportOutputSamples (const std::string & *_fname*) `[inline]`

Imports output samples from file.

6.9.4.45 void GoSUM::CContainer::exportPredictionOutputSamples (const std::string & *_fname*)

Exports prediction output samples.

6.9.4.46 void GoSUM::CContainer::exportSamples (**CModelVariables** * *pMVs,* const std::string & *_fname*)

Exports samples for model variables, input and output.

6.9.4.47 void GoSUM::CContainer::exportVarianceSensitivity (const std::string & *_fname*)

Exports variance sensitivity.

6.9.4.48 **CGAModelOptimization**& GoSUM::CContainer::gaOptimizer ( ) [inline]

Returns MADS.

6.9.4.49 **CHypercube**& GoSUM::CContainer::hyperCube ( ) [inline]

Returns hypercube.

6.9.4.50 void GoSUM::CContainer::importDeclaredEmpiricalVariables (**GoSUM::CModelVariables** $*$ *pMVs,* const std::string & *_fname,* int & *SSize,* std::vector$<$ **CRandomVariable::distributiontype** $>$ & *dtypes*)

Imports multiple empirical model variables from a file.

6.9.4.51 void GoSUM::CContainer::importEmpiricalVariables (**GoSUM::CModelVariables** $*$ *pMVs,* const std::string & *_fname,* int & *SSize,* std::vector$<$ **CRandomVariable::distributiontype** $>$ & *dtypes*)

Imports multiple empirical model variables from a file.

6.9.4.52 void GoSUM::CContainer::importInitialValue (const std::string & *_fname*)

Imports inital values for optimization variables.

6.9.4.53 void GoSUM::CContainer::importInputs (const std::string & *_fname*) [inline]

Imports multiple input parameters.

6.9.4.54 void GoSUM::CContainer::importLowerBound (const std::string & *_fname*)

Imports lower bounds for optimization variables.

6.9.4.55 void GoSUM::CContainer::importModelConstraints (const std::string & *_fname*)

Imports model constraint expressions.

6.9.4.56 void GoSUM::CContainer::importNamedDeclaredEmpiricalVariables (**GoSUM::CModelVariables** $*$ *pMVs,* const std::string & *_fname,* int & *SSize,* std::vector$<$ **CRandomVariable::distributiontype** $>$ & *dtypes*)

Imports multiple empirical model variables from a file.

6.9.4.57 void GoSUM::CContainer::importNamedEmpiricalVariables (**GoSUM::CModelVariables** $*$ *pMVs,* const std::string & *_fname,* int & *SSize,* std::vector$<$ **CRandomVariable::distributiontype** $>$ & *dtypes*)

Imports multiple empirical model variables from a file.

6.9.4.58 void GoSUM::CContainer::importNamedTheoreticalVariables (**GoSUM::CModelVariables** $*$ *pMVs,* const std::string & *_fname*)

Imports multiple theoretical model variables from a file.

6.9.4.59 void GoSUM::CContainer::importOptimizationConstraints (const std::string & *_fname*)

Imports optimization constraint expressions.

6.9.4.60 void GoSUM::CContainer::importOutputs (const std::string & *_fname*) [inline]

Imports multiple output states.

6.9.4.61 bool GoSUM::CContainer::importPredictionInputSamples (const std::string & *_fname*)

Imports prediction input samples.

6.9.4.62 void GoSUM::CContainer::importTheoreticalVariables (GoSUM::CModelVariables ∗ *pMVs,* const std::string & *_fname*)

Imports multiple theoretical model variables from a file.

6.9.4.63 void GoSUM::CContainer::importUpperBound (const std::string & *_fname*)

Imports upper bounds for optimization variables.

6.9.4.64 void GoSUM::CContainer::importVariables (GoSUM::CModelVariables ∗ *pMVs,* const std::string & *_fname*)

Imports multiple model variables from a file, input and output.

6.9.4.65 CModelVariable& GoSUM::CContainer::inputParameter (int *_at*) [inline]

Returns particular input parameter.

6.9.4.66 CInputParameters& GoSUM::CContainer::inputParameters ( ) [inline]

Returns input parameters.

6.9.4.67 int GoSUM::CContainer::inputsSize ( ) [inline]

Returns input parameters size.

6.9.4.68 bool GoSUM::CContainer::isSampleSelected (int *_i*) const

Returns true if particular sample value is selected, false otherwise.

6.9.4.69 void GoSUM::CContainer::join ( )

Joins thread for computation.

6.9.4.70 int GoSUM::CContainer::learnEvaluationSize ( ) [inline]

Returns maximal number of learn optimization evaluations.

6.9.4.71 int GoSUM::CContainer::learningStepsSize ( ) const [inline]

Returns learning steps size.

6.9.4.72 void GoSUM::CContainer::learnModel ( )

Learns model.

6.9.4.73 void GoSUM::CContainer::load ( )

Loads project from binary format.

6.9.4.74 void GoSUM::CContainer::loadTxt ( )

Loads project from txt format.

6.9.4.75 void GoSUM::CContainer::loadXml ( )

Loads project from xml format.

6.9.4.76 std::string GoSUM::CContainer::longProjectName ( )

Returns long project name.

6.9.4.77 CMADS& GoSUM::CContainer::madsOptimizer ( ) [inline]

Returns MADS.

6.9.4.78 void GoSUM::CContainer::maximize ( )

Maximizes.

6.9.4.79 void GoSUM::CContainer::minimize ( )

Minimizes.

6.9.4.80 CModelConstraints& GoSUM::CContainer::modelConstraints ( ) [inline]

Returns model constraints.

6.9.4.81 CEvaluator& GoSUM::CContainer::modelEvaluator ( ) [inline]

Returns evaluator.

6.9.4.82 optimizationmethodtype GoSUM::CContainer::optimizationMethod ( ) [inline]

Returns chosen optimization method type.

6.9.4.83 GoSUM::CContainer::optimizationmethodtype GoSUM::CContainer::OptimizationMethodType (const std::string & _stype) [static]

Converts optimization method name (string) to optimizationmethodtype enumerator.

6.9.4.84 CSimpleOptimizationProblem∗ GoSUM::CContainer::optimizationProblem ( ) [inline]

Returns optimization problem.

6.9.4.85 int GoSUM::CContainer::optimizationStepsSize ( ) const [inline]

Returns maximal number of optimization evaluations.

6.9.4.86 void GoSUM::CContainer::optimize ( )

Optimizes.

6.9.4.87 int GoSUM::CContainer::outputsSize ( ) [inline]

Returns output states size.

6.9.4.88 CModelVariable& GoSUM::CContainer::outputState (int _at) [inline]

Returns particular output state.

6.9.4.89 COutputStates& GoSUM::CContainer::outputStates ( ) [inline]

Returns output states.

6.9.4.90 void GoSUM::CContainer::predict ( ) [inline]

Predicts (using analytical model).

6.9.4.91 void GoSUM::CContainer::predictMean (ArrayXd & *ymu*, ArrayXd & *yvar*)

Predicts mean and variance using learned model.

6.9.4.92 std::string GoSUM::CContainer::projectName ( ) [inline]

Returns project name.

6.9.4.93 std::string GoSUM::CContainer::projectPath ( ) [inline]

Returns project path.

6.9.4.94 GoSUM::CContainer::projecttype GoSUM::CContainer::ProjectType (const std::string & _stype) [static]

Converts project type name (string) to projecttype enumerator-.

6.9.4.95 projecttype GoSUM::CContainer::projectType ( ) [inline]

Returns chosen project type.

6.9.4.96 bool GoSUM::CContainer::readyToComputeSensitivities ( )

Returns true if project is ready to compute sensitivities, false otherwise.

6.9.4.97 bool GoSUM::CContainer::readyToEvaluateOutputs ( )

Returns true if project is ready to evaluate outputs, false otherwise.

outputs.empty() &&

6.9.4.98 bool GoSUM::CContainer::readyToLearnModel ( )

Returns true if project is ready to learn model, false otherwise.

6.9.4.99 bool GoSUM::CContainer::readyToOptimize ( )

Returns true if project is ready to optimize, false otherwise.

6.9.4.100 bool GoSUM::CContainer::readyToReduceModel ( )

Returns true if project is ready to reduce model, false otherwise.

6.9.4.101 bool GoSUM::CContainer::readyToSampleInputs ( )

Returns true if project is ready to sample inputs, false otherwise.

6.9.4.102 bool GoSUM::CContainer::readyToSetOptimization ( )

Returns true if project is ready to set optimization, false otherwise.

6.9.4.103 void GoSUM::CContainer::reduce ( )

Reduces model.

6.9.4.104 CReduction& GoSUM::CContainer::reducer ( ) [inline]

Returns reduction tool.

6.9.4.105 void GoSUM::CContainer::resampleInputs ( )

Resamples input parameters.

6.9.4.106 void GoSUM::CContainer::resetOptimizationVariable (CModelVariables * *pMVs,* int *_at*)

Resets values in the particular optimization variable.

6.9.4.107 void GoSUM::CContainer::save ( )

Saves project to binary format.

6.9.4.108 void GoSUM::CContainer::saveTxt ( )

Saves project to txt format.

6.9.4.109 void GoSUM::CContainer::saveXml ( )

Saves project to xml format.

6.9.4.110 std::vector<int>& GoSUM::CContainer::selectedSamples ( ) `[inline]`

6.9.4.111 void GoSUM::CContainer::selectSamples (CModelVariable * *pmv,* double *_left,* double *_right*)

Selects sample values of variable pmv that are contained in [_left,_right] interval.

6.9.4.112 CSensitivityAnalysis& GoSUM::CContainer::sensitivityAnalysis ( ) `[inline]`

Returns sensitivity analysis.

6.9.4.113 void GoSUM::CContainer::separateBySelection (const ArrayXd & *X,* std::vector< double > & *x,* std::vector< double > & *selx*) const

Separates array X into two vectors based on the index (not contained/contained in selected samples).

6.9.4.114 template<class Archive > void GoSUM::CContainer::serialize (Archive & *ar,* const unsigned int *version*) `[private]`

6.9.4.115 void GoSUM::CContainer::setInitialValue (const ArrayXd & *_x0*)

Sets initial value of the optimization variables.

6.9.4.116 void GoSUM::CContainer::setLowerBound (const ArrayXd & *_xL*)

Sets lower bound of the optimization variables.

6.9.4.117 void GoSUM::CContainer::setMadsInitMeshSize (double *_ims*) `[inline]`

Sets MADS initial mesh size.

6.9.4.118 void GoSUM::CContainer::setMadsLHSearch (int *_lh0,* int *_lhi*) `[inline]`

Sets MADS lh search paraemters.

6.9.4.119 void GoSUM::CContainer::setMadsMaxEvaluation (int *_maxeval*) `[inline]`

Sets MADS maximal number of evaluations.

6.9.4.120 void GoSUM::CContainer::setMadsMinPollSize (double *_mps*) [inline]

Sets MADS final poll size.

6.9.4.121 void GoSUM::CContainer::setMatLabPath (const std::string & *_matlabPath*) [inline]

Sets MatLab path.

6.9.4.122 void GoSUM::CContainer::setModelEvaluator (GoSUM::CModelEvaluator::evaluatortype *_me,* const std::string & *_filename*)

Sets model evaluator.

6.9.4.123 void GoSUM::CContainer::setObjective (const std::string & *_fexpr*)

Sets objective of the optimization problem.

6.9.4.124 void GoSUM::CContainer::setOptimizationMethod (optimizationmethodtype *_omType*) [inline]

Sets chosen optimization method type.

6.9.4.125 void GoSUM::CContainer::setProjectName (const std::string & *_prjName*) [inline]

Sets project name.

6.9.4.126 void GoSUM::CContainer::setProjectPath (const std::string & *_prjPath*) [inline]

Sets project path.

6.9.4.127 void GoSUM::CContainer::setProjectType (projecttype *_prjType*)

Sets chosen project type.

6.9.4.128 void GoSUM::CContainer::setReductionCutoffSize (int *_cutip*) [inline]

Sets reduction inputs cutoff size.

6.9.4.129 void GoSUM::CContainer::setReductionCutoffValue (double *_cutval*) [inline]

Sets reduction inputs cut value.

6.9.4.130 void GoSUM::CContainer::setReductionOutputs (const std::vector< std::string > & *_selOS*) [inline]

Sets reduction outputs.

6.9.4.131 void GoSUM::CContainer::setReductionType (GoSUM::CReduction::reductiontype *_rtype*) [inline]

Sets model reduction type.

6.9.4.132 void GoSUM::CContainer::setResampleSize (int _N) [inline]

Sets resample size.

6.9.4.133 void GoSUM::CContainer::setResampleType (CHypercube::hctype _type) [inline]

Sets resample type.

6.9.4.134 void GoSUM::CContainer::setRNG (CRandomGenerator::rngtype _type) [inline]

Sets chosen rng type.

6.9.4.135 void GoSUM::CContainer::setSensitivityOptions (int _N, double _eps1 = 0.005, double _eps2 = 0.01, double _eps3 = 0.01)

Sets sensitivity parameters.

6.9.4.136 void GoSUM::CContainer::setThreadSize (int _trdN) [inline]

Sets chosen thread size.

6.9.4.137 void GoSUM::CContainer::setUpperBound (const ArrayXd & _xU)

Sets upper bound of the optimization variables.

6.9.4.138 void GoSUM::CContainer::setVoronoiOptions (int _maxiter, int _q, double _alpha2, double _beta2) [inline]

Sets Voronoi options.

6.9.4.139 void GoSUM::CContainer::startEvaluating ( )

Starts evaluating outputs.

6.9.4.140 void GoSUM::CContainer::startLearning ( )

Starts learning model.

6.9.4.141 void GoSUM::CContainer::startOptimizing ( )

Starts optimizing.

6.9.4.142 void GoSUM::CContainer::startResampling ( )

Starts sampling inputs.

6.9.4.143 void GoSUM::CContainer::startSensitivityComputing ( )

Starts sensitivity computing.

6.9.5 Friends And Related Function Documentation

6.9.5.1 friend class boost::serialization::access [friend]

Boost serialization.

6.9.6 Member Data Documentation

6.9.6.1 CAnalyticalModel GoSUM::CContainer::analytical [private]

Analytic model of the project.

6.9.6.2 boost::signal<void()> GoSUM::CContainer::evaluatingFinished

Signal for evaluating outputs finshed.

6.9.6.3 CEvaluator GoSUM::CContainer::evaluator [private]

Basic evalautor of the project, used only for model based projects.

6.9.6.4 CGAModelOptimization GoSUM::CContainer::GAMO [private]

Genetic Algorithms optimization method.

6.9.6.5 CHypercube GoSUM::CContainer::hycube [private]

Basic hypercube, used for resampling.

6.9.6.6 CModelConstraints GoSUM::CContainer::inconsts [private]

Model constraints, i.e. constraints on input paramters.

6.9.6.7 CInputParameters GoSUM::CContainer::inputs [private]

Input parameters of the project.

6.9.6.8 boost::signal<void()> GoSUM::CContainer::learningFinished

Signal for learning model finshed.

6.9.6.9 CMADS GoSUM::CContainer::MADS [private]

Mesh Adaptive Direct Search optimization method.

6.9.6.10 optimizationmethodtype GoSUM::CContainer::omType [private]

Optimization method type.

6.9.6.11 boost::signal<void()> GoSUM::CContainer::optimizingFinished

Signal for optimizing finshed.

6.9.6.12 COutputStates GoSUM::CContainer::outputs [private]

Output states of the project.

6.9.6.13 CSimpleOptimizationProblem* GoSUM::CContainer::pOP [private]

Defined optimization problem.

6.9.6.14 std::string GoSUM::CContainer::prjName [private]

Project path and name.

6.9.6.15 std::string GoSUM::CContainer::prjPath [private]

6.9.6.16 projecttype GoSUM::CContainer::prjType [private]

Project type.

6.9.6.17 CReduction GoSUM::CContainer::reduced [private]

Reduction operator.

6.9.6.18 boost::signal<void()> GoSUM::CContainer::resamplingFinished

Signal for sampling inputs finshed.

6.9.6.19 std::vector<int> GoSUM::CContainer::selectedsamples [private]

Vector of selected sample values indices.

6.9.6.20 CSensitivityAnalysis GoSUM::CContainer::sensitivity [private]

Sensistivity analysis of the analytical model.

6.9.6.21 boost::signal<void()> GoSUM::CContainer::sensitivityComputingFinished

Signal for sensitivity computing finshed.

6.9.6.22 boost::thread GoSUM::CContainer::thrd

Thread for computations.

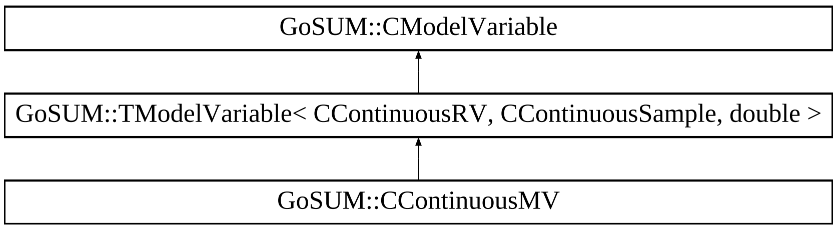
The documentation for this class was generated from the following files:

- C:/Development/core/Container.h
- C:/Development/core/Container.cpp

6.10 GoSUM::CContinuousMV Class Reference

```
#include <ModelVariable.h>
```

Inheritance diagram for GoSUM::CContinuousMV:


GoSUM::CModelVariable
GoSUM::TModelVariable< CContinuousRV, CContinuousSample, double >
GoSUM::CContinuousMV

Public Member Functions

- CContinuousMV (const std::string &_uname, CRandomVariable::distributiontype _type)

  Constructs new model variable by name and type.
- CContinuousMV (const CContinuousMV &O)
- virtual void setTheoreticalDistribution ()

  Tests goodness-of-fit for theoretical random variables and replaces with the best that satisfies Kolomogorov-Smirnov.
- virtual void setEmpiricalDistribution ()

  Compute distribution of the actual random variable from empirical sample data.
- virtual bool isContinuous () const

  Returns true if model variable is continuous, false otherwise.
- virtual bool isDiscrete () const

  Returns true if model variable is discrete, false otherwise.
- bool hasDiscreteData ()

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- CContinuousMV ()

  Private constructor.

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.10.1 Constructor & Destructor Documentation

6.10.1.1 GoSUM::CContinuousMV::CContinuousMV ( ) [inline], [private]

Private constructor.

6.10.1.2 GoSUM::CContinuousMV::CContinuousMV (const std::string & *_uname*, CRandomVariable::distributiontype *_type*)

Constructs new model variable by name and type.

6.10.1.3 GoSUM::CContinuousMV::CContinuousMV (const CContinuousMV & *O*)

6.10.2 Member Function Documentation

6.10.2.1 bool GoSUM::CContinuousMV::hasDiscreteData ( ) `[inline]`

6.10.2.2 virtual bool GoSUM::CContinuousMV::isContinuous ( ) const `[inline], [virtual]`

Returns true if model variable is continuous, false otherwise.

Implements GoSUM::CModelVariable.

6.10.2.3 virtual bool GoSUM::CContinuousMV::isDiscrete ( ) const `[inline], [virtual]`

Returns true if model variable is discrete, false otherwise.

Implements GoSUM::CModelVariable.

6.10.2.4 template<class Archive > void GoSUM::CContinuousMV::serialize (Archive & *ar*, const unsigned int *version*) `[inline], [private]`

6.10.2.5 virtual void GoSUM::CContinuousMV::setEmpiricalDistribution ( ) `[inline], [virtual]`

Compute distribution of the actual random variable from empirical sample data.

Implements GoSUM::TModelVariable< R, S, t >.

6.10.2.6 void GoSUM::CContinuousMV::setTheoreticalDistribution ( ) `[virtual]`

Tests goodness-of-fit for theoretical random variables and replaces with the best that satisfies Kolomogorov--Smirnov.

Implements GoSUM::TModelVariable< R, S, t >.

6.10.3 Friends And Related Function Documentation

6.10.3.1 friend class boost::serialization::access `[friend]`

Boost serialization.

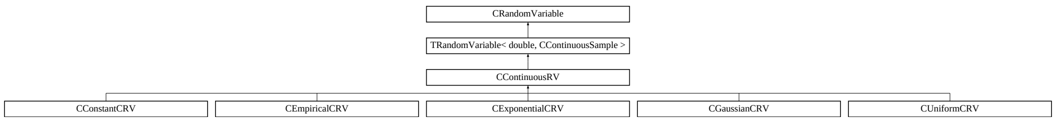
The documentation for this class was generated from the following files:

- C:/Development/core/ModelVariable.h
- C:/Development/core/ModelVariable.cpp

6.11 CContinuousRV Class Reference

`#include <RandomVariable.h>`

Inheritance diagram for CContinuousRV:



Public Member Functions

- CContinuousRV ()
- CContinuousRV (const CContinuousRV &O)
- double probability (double _x1, double _x2) const

    Returns probablilty that random variable has value between _x1 and _x2.
- virtual double quantile (double _p) const

    Quantile, only argument checking.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Friends

- class boost::serialization::access

    Boost serialization.

Additional Inherited Members

6.11.1 Constructor & Destructor Documentation

6.11.1.1 CContinuousRV::CContinuousRV ( ) [inline]

6.11.1.2 CContinuousRV::CContinuousRV (const **CContinuousRV** & *O*) [inline]

6.11.2 Member Function Documentation

6.11.2.1 double CContinuousRV::probability (double *_x1,* double *_x2*) const [inline]

Returns probablilty that random variable has value between _x1 and _x2.

6.11.2.2 virtual double CContinuousRV::quantile (double *_p*) const [inline], [virtual]

Quantile, only argument checking.

Implements CRandomVariable.

6.11.2.3 template<class Archive > void CContinuousRV::serialize (Archive & *ar,* const unsigned int *version*) [inline], [private]

6.11.3 Friends And Related Function Documentation

6.11.3.1 friend class boost::serialization::access [friend]

Boost serialization.

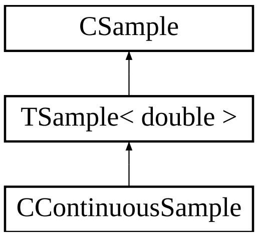
The documentation for this class was generated from the following file:

- C:/Development/core/RandomVariable.h

6.12 CContinuousSample Class Reference

```
#include <Sample.h>
```

Inheritance diagram for CContinuousSample:



Public Member Functions

- CContinuousSample ()
- virtual ∼CContinuousSample ()
- CContinuousSample (const CContinuousSample &O)
- virtual void computeStatistics (int _n)

  Computes sample statistics, i.e. normalized histogram etc.
- virtual double mean () const

  Returns empirical mean.
- virtual double standardDeviation () const

  Returns empirical standard deviation.
- virtual double exportHistogram (ArrayXd &_x, ArrayXd &_H) const

  Exports histogram (x,H).
- virtual void exportSubHistogram (ArrayXd &_subH, const std::vector< int > &subset) const

  Exports histogram relative to a subset of sample data.
- virtual double variance () const

  Returns sample variance (i.e.empirical).
- bool hasDiscreteData ()

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Protected Attributes

- double mu
- double stdv

Private Member Functions

- virtual void computeNormalizedHistogram (int _n)

  Computes normalized histogram from sample data.
- virtual void computeNormalizedSubHistogram (ArrayXd &_subH, const std::vector< int > &subset) const

  Computes normalized histogram from a subset of sample data.
- virtual void computeMeanAndStandardDeviation ()

  Computes empirical mean and standard deviation.

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.12.1 Constructor & Destructor Documentation

6.12.1.1 CContinuousSample::CContinuousSample ( ) [inline]

6.12.1.2 virtual CContinuousSample::∼CContinuousSample ( ) [inline], [virtual]

6.12.1.3 CContinuousSample::CContinuousSample (const CContinuousSample & *O*) [inline]

6.12.2 Member Function Documentation

6.12.2.1 void CContinuousSample::computeMeanAndStandardDeviation ( ) [private], [virtual]

Computes empirical mean and standard deviation.

6.12.2.2 void CContinuousSample::computeNormalizedHistogram (int *_n*) [private], [virtual]

Computes normalized histogram from sample data.

6.12.2.3 void CContinuousSample::computeNormalizedSubHistogram (ArrayXd & *_subH,* const std::vector< int > & *subset*) const [private], [virtual]

Computes normalized histogram from a subset of sample data.

6.12.2.4 virtual void CContinuousSample::computeStatistics (int *_n*) [inline], [virtual]

Computes sample statistics, i.e. normalized histogram etc.

Implements CSample.

6.12.2.5 double CContinuousSample::exportHistogram (ArrayXd & *_x,* ArrayXd & *_H*) const [virtual]

Exports histogram (x,H).

6.12.2.6 void CContinuousSample::exportSubHistogram (ArrayXd & *_subH,* const std::vector< int > & *subset*) const [virtual]

Exports histogram relative to a subset of sample data.

Implements TSample< t >.

6.12.2.7 bool CContinuousSample::hasDiscreteData ( )

6.12.2.8 virtual double CContinuousSample::mean ( ) const [inline], [virtual]

Returns empirical mean.

6.12.2.9 template<class Archive > void CContinuousSample::serialize (Archive & *ar,* const unsigned int *version*) [protected]

Reimplemented from TSample< t >.

6.12.2.10 virtual double CContinuousSample::standardDeviation ( ) const [inline], [virtual]

Returns empirical standard deviation.

6.12.2.11 virtual double CContinuousSample::variance ( ) const [inline], [virtual]

Returns sample variance (i.e.empirical).

Implements CSample.

6.12.3 Friends And Related Function Documentation

6.12.3.1 friend class boost::serialization::access [friend]

Boost serialization.

6.12.4 Member Data Documentation

6.12.4.1 double CContinuousSample::mu [protected]

6.12.4.2 double CContinuousSample::stdv [protected]

Empirical mean (mu) and standard deviation (std).

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

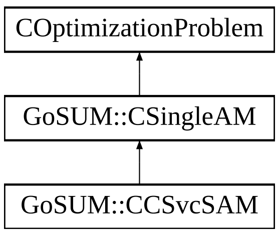
- C:/Development/core/Sample.h
- C:/Development/core/Sample.cpp

6.13 GoSUM::CCSvcSAM Class Reference

Class for the analyitical model for single output state, SVC type.

```
#include <AnalyticalModel.h>
```

Inheritance diagram for GoSUM::CCSvcSAM:



Public Member Functions

- CCSvcSAM ()
- virtual ∼CCSvcSAM ()

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.13.1 Detailed Description

Class for the analyitical model for single output state, SVC type.

6.13.2 Constructor & Destructor Documentation

6.13.2.1 GoSUM::CCSvcSAM::CCSvcSAM ( ) [inline]

6.13.2.2 virtual GoSUM::CCSvcSAM::∼CCSvcSAM ( ) [inline], [virtual]

6.13.3 Member Function Documentation

6.13.3.1 template<class Archive > void GoSUM::CCSvcSAM::serialize (Archive & *ar,* const unsigned int *version*) [protected]

Reimplemented from GoSUM::CSingleAM.

6.13.4 Friends And Related Function Documentation

6.13.4.1 friend class boost::serialization::access [friend]

Boost serialization.

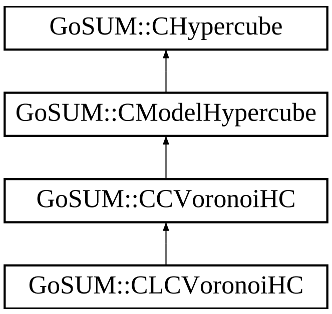
The documentation for this class was generated from the following files:

- C:/Development/core/AnalyticalModel.h
- C:/Development/core/AnalyticalModel.cpp

6.14 GoSUM::CCVoronoiHC Class Reference

```
#include <Hypercube.h>
```

Inheritance diagram for GoSUM::CCVoronoiHC:



Public Member Functions

- CCVoronoiHC (CInputParameters ∗_pIP)
- virtual ∼CCVoronoiHC ()

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- virtual void doGenerate (int _rssize, int _dim, std::vector< ArrayXd > &_samples)

  Core of the generation.
- void centralize (std::vector< ArrayXd > &_samples)

  Centralizes model points _samples.
- CCVoronoiHC ()

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.14.1 Constructor & Destructor Documentation

6.14.1.1 GoSUM::CCVoronoiHC::CCVoronoiHC ( ) [inline], [protected]

6.14.1.2 GoSUM::CCVoronoiHC::CCVoronoiHC (CInputParameters ∗ *_pIP*) [inline]

6.14.1.3 virtual GoSUM::CCVoronoiHC::∼CCVoronoiHC ( ) [inline], [virtual]

6.14.2 Member Function Documentation

6.14.2.1 void GoSUM::CCVoronoiHC::centralize (std::vector< ArrayXd > & *_samples*) [protected]

Centralizes model points _samples.

6.14.2.2 void GoSUM::CCVoronoiHC::doGenerate (int *_rssize,* int *_dim,* std::vector< ArrayXd > & *_samples*) [protected], [virtual]

Core of the generation.

Implements GoSUM::CModelHypercube.

Reimplemented in GoSUM::CLCVoronoiHC.

6.14.2.3 template<class Archive > void GoSUM::CCVoronoiHC::serialize (Archive & *ar,* const unsigned int *version*) [protected]

Reimplemented from GoSUM::CModelHypercube.

Reimplemented in GoSUM::CLCVoronoiHC.

6.14.3 Friends And Related Function Documentation

6.14.3.1 friend class boost::serialization::access [friend]

Boost serialization.

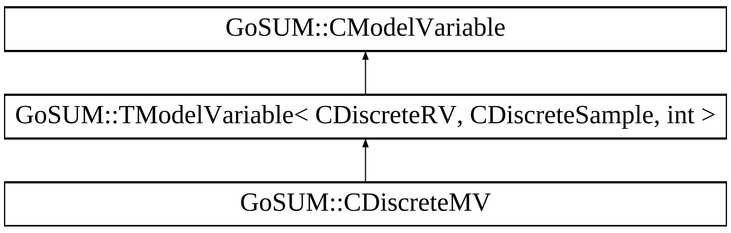
The documentation for this class was generated from the following files:

- C:/Development/core/Hypercube.h
- C:/Development/core/Hypercube.cpp

6.15 GoSUM::CDiscreteMV Class Reference

```
#include <ModelVariable.h>
```

Inheritance diagram for GoSUM::CDiscreteMV:



Public Member Functions

- CDiscreteMV (const std::string &_uname, CRandomVariable::distributiontype _type)

  Constructs new model variable by name and type.
- CDiscreteMV (const CDiscreteMV &O)
- CDiscreteMV (const CContinuousMV &O)
- virtual void setTheoreticalDistribution ()

  Detects constant sample and turns random variable to appropirate type.
- virtual void setEmpiricalDistribution ()

  Compute distribution of the actual random variable from empirical sample data.
- virtual bool isContinuous () const

  Returns true if model variable is continuous, false otherwise.
- virtual bool isDiscrete () const

  Returns true if model variable is discrete, false otherwise.

Private Member Functions

- template< class Archive >
  void serialize (Archive &ar, const unsigned int version)
- CDiscreteMV ()

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.15.1 Constructor & Destructor Documentation

6.15.1.1 GoSUM::CDiscreteMV::CDiscreteMV ( ) [inline], [private]

6.15.1.2 GoSUM::CDiscreteMV::CDiscreteMV (const std::string & *_uname,* CRandomVariable::distributiontype *_type*)

Constructs new model variable by name and type.

6.15.1.3 GoSUM::CDiscreteMV::CDiscreteMV (const CDiscreteMV & *O*)

6.15.1.4 GoSUM::CDiscreteMV::CDiscreteMV (const CContinuousMV & *O*)

6.15.2 Member Function Documentation

6.15.2.1 virtual bool GoSUM::CDiscreteMV::isContinuous ( ) const [inline], [virtual]

Returns true if model variable is continuous, false otherwise.

Implements GoSUM::CModelVariable.

6.15.2.2 virtual bool GoSUM::CDiscreteMV::isDiscrete ( ) const [inline], [virtual]

Returns true if model variable is discrete, false otherwise.

Implements GoSUM::CModelVariable.

6.15.2.3 template< class Archive > void GoSUM::CDiscreteMV::serialize (Archive & *ar,* const unsigned int *version*) [inline], [private]

6.15.2.4 virtual void GoSUM::CDiscreteMV::setEmpiricalDistribution ( ) [inline], [virtual]

Compute distribution of the actual random variable from empirical sample data.

Implements GoSUM::TModelVariable< R, S, t >.

6.15.2.5 void GoSUM::CDiscreteMV::setTheoreticalDistribution ( ) [virtual]

Detects constant sample and turns random variable to appropriate type.

Implements GoSUM::TModelVariable< R, S, t >.

6.15.3 Friends And Related Function Documentation

6.15.3.1 friend class boost::serialization::access `[friend]`

Boost serialization.

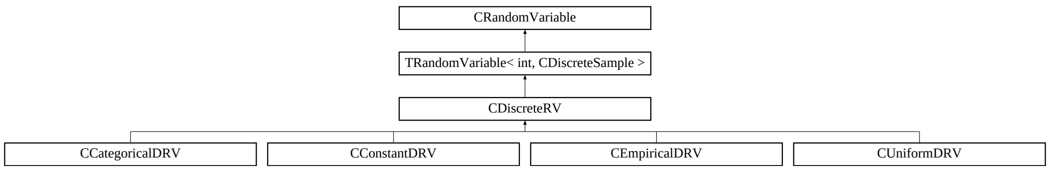
The documentation for this class was generated from the following files:

- C:/Development/core/ModelVariable.h
- C:/Development/core/ModelVariable.cpp

6.16 CDiscreteRV Class Reference

`#include <RandomVariable.h>`

Inheritance diagram for CDiscreteRV:



Public Member Functions

- CDiscreteRV ()
- CDiscreteRV (const CDiscreteRV &O)
- virtual double quantile (double _p) const

  Quantile, only argument checking.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.16.1 Constructor & Destructor Documentation

6.16.1.1 CDiscreteRV::CDiscreteRV ( ) `[inline]`

6.16.1.2 CDiscreteRV::CDiscreteRV (const CDiscreteRV & *O*) `[inline]`

6.16.2 Member Function Documentation

6.16.2.1 virtual double CDiscreteRV::quantile (double _p) const [inline], [virtual]

Quantile, only argument checking.

Implements CRandomVariable.

6.16.2.2 template<class Archive > void CDiscreteRV::serialize (Archive & *ar*, const unsigned int *version*) [inline], [private]

6.16.3 Friends And Related Function Documentation

6.16.3.1 friend class boost::serialization::access [friend]

Boost serialization.

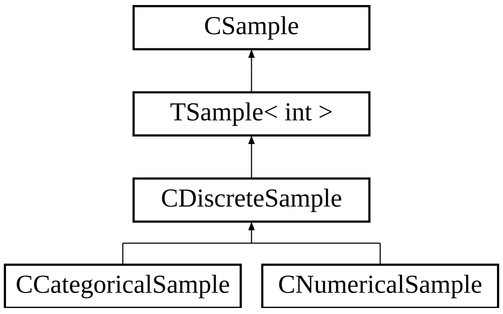
The documentation for this class was generated from the following file:

- C:/Development/core/RandomVariable.h

6.17 CDiscreteSample Class Reference

```
#include <Sample.h>
```

Inheritance diagram for CDiscreteSample:



Public Member Functions

- CDiscreteSample ()
- virtual ~CDiscreteSample ()
- CDiscreteSample (const CDiscreteSample &O)
- virtual void computeStatistics (int _n)

    Computes sample statistics, i.e. normalized histogram etc.
- virtual int exportHistogram (ArrayXi &_x, ArrayXd &_H) const

    Exports histogram (x,H).
- virtual void exportSubHistogram (ArrayXd &_subH, const std::vector< int > &subset) const

    Exports histogram relative to a subset of sample data.
- virtual double variance () const

    Returns sample variance (i.e.empirical).

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Member Functions

- virtual void computeNormalizedHistogram (int _n)

  C.omputes normalized histogram from sample data.
- virtual void computeNormalizedSubHistogram (ArrayXd &_subH, const std::vector< int > &subset) const

  Computes normalized histogram from a subset of sample data.

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.17.1 Constructor & Destructor Documentation

6.17.1.1 CDiscreteSample::CDiscreteSample ( ) [inline]

6.17.1.2 virtual CDiscreteSample::∼CDiscreteSample ( ) [inline], [virtual]

6.17.1.3 CDiscreteSample::CDiscreteSample (const CDiscreteSample & *O*) [inline]

6.17.2 Member Function Documentation

6.17.2.1 void CDiscreteSample::computeNormalizedHistogram (int *_n*) [private], [virtual]

C.omputes normalized histogram from sample data.

6.17.2.2 void CDiscreteSample::computeNormalizedSubHistogram (ArrayXd & *_subH,* const std::vector< int > & *subset*) const [private], [virtual]

Computes normalized histogram from a subset of sample data.

6.17.2.3 virtual void CDiscreteSample::computeStatistics (int *_n*) [inline], [virtual]

Computes sample statistics, i.e. normalized histogram etc.

Implements CSample.

6.17.2.4 int CDiscreteSample::exportHistogram (ArrayXi & *_x,* ArrayXd & *_H*) const [virtual]

Exports histogram (x,H).

6.17.2.5 void CDiscreteSample::exportSubHistogram (ArrayXd & *_subH,* const std::vector< int > & *subset*) const [virtual]

Exports histogram relative to a subset of sample data.

Implements TSample< t >.

6.17.2.6 template< class Archive > void CDiscreteSample::serialize (Archive & *ar*, const unsigned int *version*) [protected]

Reimplemented from TSample< t >.

6.17.2.7 virtual double CDiscreteSample::variance ( ) const [inline], [virtual]

Returns sample variance (i.e.empirical).

Implements CSample.

Reimplemented in CCategoricalSample, and CNumericalSample.

6.17.3 Friends And Related Function Documentation

6.17.3.1 friend class boost::serialization::access [friend]

Boost serialization.

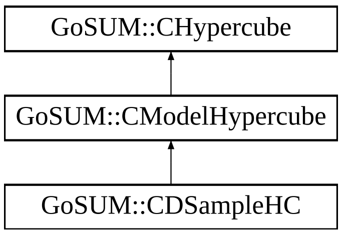
The documentation for this class was generated from the following files:

- C:/Development/core/Sample.h
- C:/Development/core/Sample.cpp

6.18 GoSUM::CDSampleHC Class Reference

`#include <Hypercube.h>`

Inheritance diagram for GoSUM::CDSampleHC:



Public Member Functions

- CDSampleHC (CInputParameters ∗_pIP)
- virtual ∼CDSampleHC ()

Protected Member Functions

- virtual void doGenerate (int _rssize, int _dim, std::vector< ArrayXd > &_samples)

  Core of the generation.
- CDSampleHC ()

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.18.1 Constructor & Destructor Documentation

6.18.1.1 GoSUM::CDSampleHC::CDSampleHC ( ) [inline], [protected]

6.18.1.2 GoSUM::CDSampleHC::CDSampleHC (CInputParameters ∗ *_pIP*) [inline]

6.18.1.3 virtual GoSUM::CDSampleHC::∼CDSampleHC ( ) [inline], [virtual]

6.18.2 Member Function Documentation

6.18.2.1 void GoSUM::CDSampleHC::doGenerate (int *_rssize,* int *_dim,* std::vector< ArrayXd > & *_samples*) [protected], [virtual]

Core of the generation.

Implements GoSUM::CModelHypercube.

6.18.2.2 template<class Archive > void GoSUM::CDSampleHC::serialize (Archive & *ar,* const unsigned int *version*) [private]

6.18.3 Friends And Related Function Documentation

6.18.3.1 friend class boost::serialization::access [friend]

Boost serialization.

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

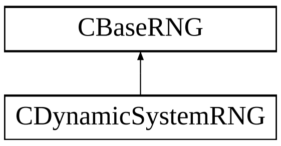
- C:/Development/core/Hypercube.h
- C:/Development/core/Hypercube.cpp

6.19 CDynamicSystemRNG Class Reference

Class for dynamic system uniform RNG.

`#include <RandomGenerators.h>`

Inheritance diagram for CDynamicSystemRNG:



Public Member Functions

- CDynamicSystemRNG ()
- CDynamicSystemRNG (unsigned int s)
- virtual ∼CDynamicSystemRNG ()
- virtual void setSeed (unsigned int s)

  Sets seed of the RNG.
- virtual unsigned int rndi ()

  Returns randomly generated unsigned int.
- virtual double rnd ()

  Returns randomly generated double between 0 and 1.

Private Types

- typedef long long int Long

Private Member Functions

- Array< long double, Dynamic, 1 > prepare (unsigned int M)

  Private function.

Private Attributes

- unsigned int k

  Paramters of the DS RNG.
- unsigned int i
- unsigned int j

  Paramters of the DS RNG.
- Long n

  Paramters of the DS RNG.
- Array< long double, Dynamic, 1 > x

  Paramters of the DS RNG.
- Array< long double, Dynamic, 1 > w

  Paramters of the DS RNG.

6.19.1 Detailed Description

Class for dynamic system uniform RNG.

6.19.2 Member Typedef Documentation

6.19.2.1 typedef long long int **CDynamicSystemRNG::Long** `[private]`

6.19.3 Constructor & Destructor Documentation

6.19.3.1 CDynamicSystemRNG::CDynamicSystemRNG ( ) `[inline]`

6.19.3.2 CDynamicSystemRNG::CDynamicSystemRNG (unsigned int *s*) `[inline]`

6.19.3.3 virtual CDynamicSystemRNG::∼CDynamicSystemRNG ( ) `[inline]`, `[virtual]`

6.19.4 Member Function Documentation

6.19.4.1 Array< long double, Dynamic, 1 > CDynamicSystemRNG::prepare (unsigned int *M*) `[private]`

Private function.

6.19.4.2 virtual double CDynamicSystemRNG::rnd ( ) `[inline]`, `[virtual]`

Returns randomly generated double between 0 and 1.

Implements CBaseRNG.

6.19.4.3 virtual unsigned int CDynamicSystemRNG::rndi ( ) `[inline]`, `[virtual]`

Returns randomly generated unsigned int.

Implements CBaseRNG.

6.19.4.4 virtual void CDynamicSystemRNG::setSeed (unsigned int *s*) `[inline]`, `[virtual]`

Sets seed of the RNG.

Parameters

s	Sets seed of the RNG.

Implements CBaseRNG.

6.19.5 Member Data Documentation

6.19.5.1 unsigned int CDynamicSystemRNG::i `[private]`

6.19.5.2 unsigned int CDynamicSystemRNG::j `[private]`

Paramters of the DS RNG.

6.19.5.3 unsigned int CDynamicSystemRNG::k `[private]`

Paramters of the DS RNG.

6.19.5.4 Long CDynamicSystemRNG::n `[private]`

Paramters of the DS RNG.

6.19.5.5 Array<long double,Dynamic,1> CDynamicSystemRNG::w `[private]`

Paramters of the DS RNG.

6.19.5.6 Array<long double,Dynamic,1> CDynamicSystemRNG::x `[private]`

Paramters of the DS RNG.

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

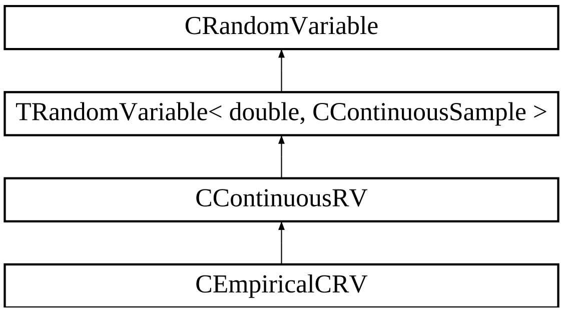
- C:/Development/core/RandomGenerators.h
- C:/Development/core/RandomGenerators.cpp

6.20 CEmpiricalCRV Class Reference

Class for empirical continuous random variables derived from continuous random variables.

`#include <RandomVariable.h>`

Inheritance diagram for CEmpiricalCRV:



Public Member Functions

- CEmpiricalCRV ()
- virtual ∼CEmpiricalCRV ()
- CEmpiricalCRV (const CEmpiricalCRV &O)
- virtual void setDistribution (const CContinuousSample &_aS)

  Computes PMF and CDF from sample histogram, application of kernel densitiy estimation algorithm.
- virtual double probability (double _x) const

  Function that returns PDF.
- virtual double cumulative (double _x) const

  Function that returns CDF.
- virtual double minValue () const

  Returns minimal value of the random variable.
- virtual double maxValue () const

  Eeturns maximal value of the random variable.
- virtual double expectedValue () const

  Returns expected value of the random variable.
- virtual distributiontype distributionType () const

  Returns enum type of the random variable distribution.
- virtual std::string distributionName () const

  Returns name of the random variable distribution.
- virtual ArrayXd exportDomain () const

  Exports domain of the random variable.
- virtual bool isDistributionDefined () const

  Returns true if distribution is defined, false otherwise.
- double mean () const

  Returns mean of empirical random variable.
- double standardDeviation () const

  Returns standard deviation of empirical random variable.
- virtual double variance () const

  Returns variance of the random variable.

Protected Member Functions

- virtual double doQuantile (double _p) const

  Quantile, formula implementation.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- ArrayXd x
- ArrayXd p
- ArrayXd cdf

  PDF (x,p) and CDF (x,cdf) data.
- double pbandwidth
- double qbandwidth

  Bandwidths of PDF and CDF, as computed in kernel density estimator.
- double mu
- double stdv

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.20.1 Detailed Description

Class for empirical continuous random variables derived from continuous random variables.

6.20.2 Constructor & Destructor Documentation

6.20.2.1 CEmpiricalCRV::CEmpiricalCRV ( ) `[inline]`

6.20.2.2 virtual CEmpiricalCRV::∼CEmpiricalCRV ( ) `[inline], [virtual]`

6.20.2.3 CEmpiricalCRV::CEmpiricalCRV (const CEmpiricalCRV & *O*) `[inline]`

6.20.3 Member Function Documentation

6.20.3.1 virtual double CEmpiricalCRV::cumulative (double *_x*) const `[inline], [virtual]`

Function that returns CDF.

6.20.3.2 virtual std::string CEmpiricalCRV::distributionName ( ) const `[inline], [virtual]`

Returns name of the random variable distribution.

Implements CRandomVariable.

6.20.3.3 virtual distributiontype CEmpiricalCRV::distributionType ( ) const [inline], [virtual]

Returns enum type of the random variable distribution.

Implements CRandomVariable.

6.20.3.4 double CEmpiricalCRV::doQuantile (double *_p*) const [protected], [virtual]

Quantile, formula implementation.

Implements CRandomVariable.

6.20.3.5 virtual double CEmpiricalCRV::expectedValue ( ) const [inline], [virtual]

Returns expected value of the random variable.

Implements CRandomVariable.

6.20.3.6 ArrayXd CEmpiricalCRV::exportDomain ( ) const [virtual]

Exports domain of the random variable.

Implements TRandomVariable< t, T >.

6.20.3.7 virtual bool CEmpiricalCRV::isDistributionDefined ( ) const [inline], [virtual]

Returns true if distribution is defined, false otherwise.

Reimplemented from CRandomVariable.

6.20.3.8 virtual double CEmpiricalCRV::maxValue ( ) const [inline], [virtual]

Eeturns maximal value of the random variable.

Implements CRandomVariable.

6.20.3.9 double CEmpiricalCRV::mean ( ) const [inline]

Returns mean of empirical random variable.

6.20.3.10 virtual double CEmpiricalCRV::minValue ( ) const [inline], [virtual]

Returns minimal value of the random variable.

Implements CRandomVariable.

6.20.3.11 virtual double CEmpiricalCRV::probability (double *_x*) const [inline], [virtual]

Function that returns PDF.

6.20.3.12 template< class Archive > void CEmpiricalCRV::serialize (Archive & *ar*, const unsigned int *version*) [private]

6.20.3.13 void CEmpiricalCRV::setDistribution (const CContinuousSample & _aS) [virtual]

Computes PMF and CDF from sample histogram, application of kernel densitiy estimation algorithm.

6.20.3.14 double CEmpiricalCRV::standardDeviation ( ) const [inline]

Returns standard deviation of empirical random variable.

6.20.3.15 virtual double CEmpiricalCRV::variance ( ) const [inline], [virtual]

Returns variance of the random variable.

Implements CRandomVariable.

6.20.4 Friends And Related Function Documentation

6.20.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.20.5 Member Data Documentation

6.20.5.1 ArrayXd CEmpiricalCRV::cdf [private]

PDF (x,p) and CDF (x,cdf) data.

6.20.5.2 double CEmpiricalCRV::mu [private]

6.20.5.3 ArrayXd CEmpiricalCRV::p [private]

6.20.5.4 double CEmpiricalCRV::pbandwidth [private]

6.20.5.5 double CEmpiricalCRV::qbandwidth [private]

Bandwidths of PDF and CDF, as computed in kernel density estimator.

6.20.5.6 double CEmpiricalCRV::stdv [private]

6.20.5.7 ArrayXd CEmpiricalCRV::x [private]

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

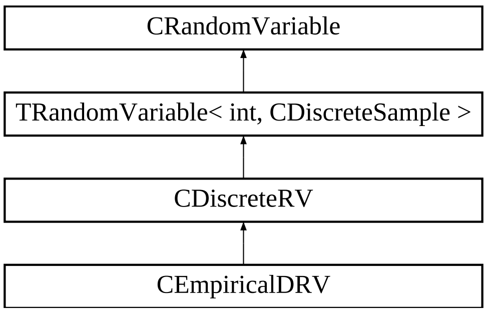
- C:/Development/core/RandomVariable.h
- C:/Development/core/RandomVariable.cpp

6.21 CEmpiricalDRV Class Reference

Class for categorical discrete random variables derived from discrete random variables.

`#include <RandomVariable.h>`

Inheritance diagram for CEmpiricalDRV:



Public Member Functions

- CEmpiricalDRV ()
- virtual ∼CEmpiricalDRV ()
- CEmpiricalDRV (const CEmpiricalDRV &O)
- virtual void setDistribution (const CDiscreteSample &_aS)

  Computes PMF and CDF from sample histogram.
- virtual double probability (int _k) const

  Function that returns PMF.
- virtual double cumulative (int _k) const

  Function that returns CDF.
- virtual int expandedSize () const
- virtual double minValue () const

  After expansion, number of new variables is equal to the number of categories.
- virtual double maxValue () const

  Returns maximal value of the random variable.
- virtual double expectedValue () const

  Returns expected value of the random variable.
- virtual distributiontype distributionType () const

  Returns enum type of the random variable distribution.
- virtual std::string distributionName () const

  Returns name of the random variable distribution.
- virtual ArrayXi exportDomain () const

  Exports domain of the random variable.
- virtual bool isDistributionDefined () const

  Returns true if distribution is defined, false otherwise.
- virtual double variance () const

  Returns variance of the random variable.

Protected Member Functions

- virtual double doQuantile (double _p) const

  Quantile, formula implementation.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- ArrayXd p
- ArrayXd cdf

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.21.1 Detailed Description

Class for categorical discrete random variables derived from discrete random variables.

6.21.2 Constructor & Destructor Documentation

6.21.2.1 CEmpiricalDRV::CEmpiricalDRV ( ) [inline]

6.21.2.2 virtual CEmpiricalDRV::∼CEmpiricalDRV ( ) [inline], [virtual]

6.21.2.3 CEmpiricalDRV::CEmpiricalDRV (const CEmpiricalDRV & *O*) [inline]

6.21.3 Member Function Documentation

6.21.3.1 virtual double CEmpiricalDRV::cumulative (int *_k*) const [inline], [virtual]

Function that returns CDF.

6.21.3.2 virtual std::string CEmpiricalDRV::distributionName ( ) const [inline], [virtual]

Returns name of the random variable distribution.

Implements CRandomVariable.

6.21.3.3 virtual distributiontype CEmpiricalDRV::distributionType ( ) const [inline], [virtual]

Returns enum type of the random variable distribution.

Implements CRandomVariable.

6.21.3.4 double CEmpiricalDRV::doQuantile (double *_p*) const [protected], [virtual]

Quantile, formula implementation.

Implements CRandomVariable.

6.21.3.5 virtual int CEmpiricalDRV::expandedSize ( ) const [inline], [virtual]

Reimplemented from CRandomVariable.

6.21.3.6 virtual double CEmpiricalDRV::expectedValue ( ) const [inline], [virtual]

Returns expected value of the random variable.

Implements CRandomVariable.

6.21.3.7 ArrayXi CEmpiricalDRV::exportDomain ( ) const [virtual]

Exports domain of the random variable.

Implements TRandomVariable< t, T >.

6.21.3.8 virtual bool CEmpiricalDRV::isDistributionDefined ( ) const [inline], [virtual]

Returns true if distribution is defined, false otherwise.

Reimplemented from CRandomVariable.

6.21.3.9 virtual double CEmpiricalDRV::maxValue ( ) const [inline], [virtual]

Returns maximal value of the random variable.

Implements CRandomVariable.

6.21.3.10 virtual double CEmpiricalDRV::minValue ( ) const [inline], [virtual]

After expansion, number of new variables is equal to the number of categories.

Returns minimal value of the random variable.

Implements CRandomVariable.

6.21.3.11 virtual double CEmpiricalDRV::probability (int *_k*) const [inline], [virtual]

Function that returns PMF.

6.21.3.12 template<class Archive > void CEmpiricalDRV::serialize (Archive & *ar,* const unsigned int *version*) [private]

6.21.3.13 void CEmpiricalDRV::setDistribution (const CDiscreteSample & *_aS*) [virtual]

Computes PMF and CDF from sample histogram.

6.21.3.14 virtual double CEmpiricalDRV::variance ( ) const [inline], [virtual]

Returns variance of the random variable.

Implements CRandomVariable.

6.21.4 Friends And Related Function Documentation

6.21.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.21.5 Member Data Documentation

6.21.5.1 ArrayXd CEmpiricalDRV::cdf [private]

PMF (p) and CDF (cdf) data.

6.21.5.2 ArrayXd CEmpiricalDRV::p [private]

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

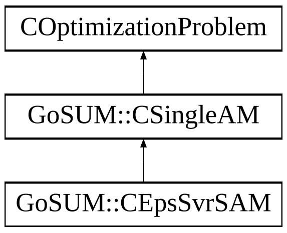
- C:/Development/core/RandomVariable.h
- C:/Development/core/RandomVariable.cpp

6.22 GoSUM::CEpsSvrSAM Class Reference

Class for the analyitical model for single output state, epsilon-SVR type.

`#include <AnalyticalModel.h>`

Inheritance diagram for GoSUM::CEpsSvrSAM:



Public Member Functions

- CEpsSvrSAM ()
- virtual ∼CEpsSvrSAM ()
- virtual void openOptimization ()

  Opens optmization.
- virtual void optimizationPoint2SVMParam (const ArrayXd &ov)

  Converts optimization point to SVM parameters.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.22.1 Detailed Description

Class for the analyitical model for single output state, epsilon-SVR type.

6.22.2 Constructor & Destructor Documentation

6.22.2.1 GoSUM::CEpsSvrSAM::CEpsSvrSAM ( ) `[inline]`

6.22.2.2 virtual GoSUM::CEpsSvrSAM::∼CEpsSvrSAM ( ) `[inline]`, `[virtual]`

6.22.3 Member Function Documentation

6.22.3.1 void GoSUM::CEpsSvrSAM::openOptimization ( ) `[virtual]`

Opens optmization.

Reimplemented from GoSUM::CSingleAM.

6.22.3.2 void GoSUM::CEpsSvrSAM::optimizationPoint2SVMParam (const ArrayXd & *ov*) `[virtual]`

Converts optimization point to SVM parameters.

Reimplemented from GoSUM::CSingleAM.

6.22.3.3 template<class Archive > void GoSUM::CEpsSvrSAM::serialize (Archive & *ar,* const unsigned int *version*) `[protected]`

Reimplemented from GoSUM::CSingleAM.

6.22.4 Friends And Related Function Documentation

6.22.4.1 friend class boost::serialization::access `[friend]`

Boost serialization.

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

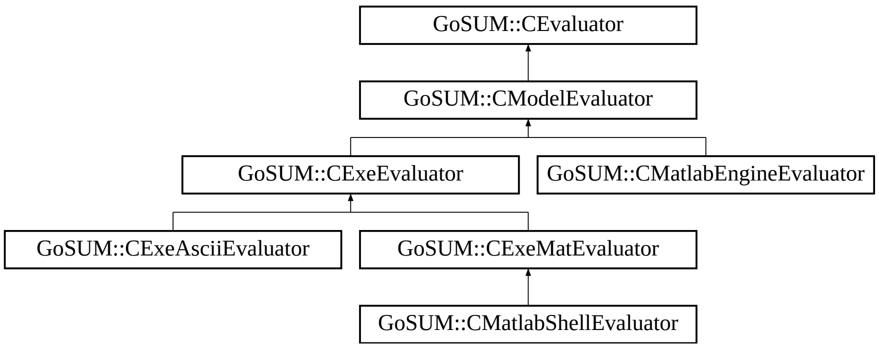
- C:/Development/core/AnalyticalModel.h
- C:/Development/core/AnalyticalModel.cpp

6.23 GoSUM::CEvaluator Class Reference

Class for GoSUM model evaluator.

```
#include <OriginalModel.h>
```

Inheritance diagram for GoSUM::CEvaluator:


GoSUM::CEvaluator
GoSUM::CModelEvaluator
GoSUM::CExeEvaluator
GoSUM::CMatlabEngineEvaluator
GoSUM::CExeAsciiEvaluator
GoSUM::CExeMatEvaluator
GoSUM::CMatlabShellEvaluator

Public Types

- enum evaluatortype { exeascii, exemat, matlabshell, matlabengine }

Public Member Functions

- CEvaluator ()
- virtual ∼CEvaluator ()

Static Public Member Functions

- static void clear ()

  Clears data.
- static int ThreadSize ()

  Returns thread size.
- static void SetThreadSize (int _trdN)

  Sets thread size.
- static void SetType (GoSUM::CEvaluator::evaluatortype _type)

  Sets evaluator type.
- static void SetExternalEvaluator (const std::string &_filename)

  Sets external evaluator.
- static evaluatortype Type (const std::string &_stype)

  Converts evaluator type name to evaluator type enumerator.
- static evaluatortype Type ()

  Returns evalutor type.
- static GoSUM::CModelEvaluator ∗ New (const CInputParameters ∗_pIP, COutputStates ∗_pOS, int _trdI=0)

  Returns new model evalutor.
- static std::string ExternalEvaluator ()

  Returns full path of the external evalautor.
- static std::string ExternalEvaluatorFolder ()

  Returns folder of the external evalautor.

Public Attributes

- boost::signal< void()> evaluatingProgressed

  Signal for evaluation progress, emitted after single evaluation.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Static Protected Attributes

- static int trdN = 1

  Total number of threads and id of the particular thread this class runs in.
- static enum evaluatortype type

  Holds type of the evalautor.
- static std::string path
- static std::string exe
- static std::string in
- static std::string out
- static std::string ext

Friends

- class boost::serialization::access

  Boost serialization.

6.23.1 Detailed Description

Class for GoSUM model evaluator.

6.23.2 Member Enumeration Documentation

6.23.2.1 enum GoSUM::CEvaluator::evaluatortype

Enumerator:

exeascii

exemat

matlabshell

matlabengine

6.23.3 Constructor & Destructor Documentation

6.23.3.1 GoSUM::CEvaluator::CEvaluator ( ) `[inline]`

6.23.3.2 virtual GoSUM::CEvaluator::∼CEvaluator ( ) `[inline], [virtual]`

6.23.4 Member Function Documentation

6.23.4.1 static void GoSUM::CEvaluator::clear ( ) `[inline], [static]`

Clears data.

6.23.4.2 std::string GoSUM::CEvaluator::ExternalEvaluator ( ) `[static]`

Returns full path of the external evalautor.

6.23.4.3 static std::string GoSUM::CEvaluator::ExternalEvaluatorFolder ( ) [inline], [static]

Returns folder of the external evalautor.

6.23.4.4 GoSUM::CModelEvaluator ∗ GoSUM::CEvaluator::New (const CInputParameters ∗ *_pIP*, COutputStates ∗ *_pOS*, int *_trdl* = 0) [static]

Returns new model evalutor.

6.23.4.5 template<class Archive > void GoSUM::CEvaluator::serialize (Archive & *ar*, const unsigned int *version*) [protected]

Reimplemented in GoSUM::CMatlabEngineEvaluator, GoSUM::CMatlabShellEvaluator, GoSUM::CExeMat-Evaluator, GoSUM::CExeAsciiEvaluator, GoSUM::CExeEvaluator, and GoSUM::CModelEvaluator.

6.23.4.6 void GoSUM::CEvaluator::SetExternalEvaluator (const std::string & *_filename*) [static]

Sets external evaluator.

6.23.4.7 static void GoSUM::CEvaluator::SetThreadSize (int *_trdN*) [inline], [static]

Sets thread size.

6.23.4.8 void GoSUM::CEvaluator::SetType (GoSUM::CEvaluator::evaluatortype *_type*) [static]

Sets evaluator type.

6.23.4.9 static int GoSUM::CEvaluator::ThreadSize ( ) [inline], [static]

Returns thread size.

6.23.4.10 GoSUM::CEvaluator::evaluatortype GoSUM::CEvaluator::Type (const std::string & *_stype*) [static]

Converts evaluator type name to evaluator type enumerator.

6.23.4.11 static evaluatortype GoSUM::CEvaluator::Type ( ) [inline], [static]

Returns evalutor type.

6.23.5 Friends And Related Function Documentation

6.23.5.1 friend class boost::serialization::access [friend]

Boost serialization.

6.23.6 Member Data Documentation

6.23.6.1 boost::signal<void()> GoSUM::CEvaluator::evaluatingProgressed

Signal for evaluation progress, emitted after single evaluation.

6.23.6.2 std::string GoSUM::CEvaluator::exe [static], [protected]

6.23.6.3 std::string GoSUM::CEvaluator::ext [static], [protected]

Names of the external executable, and its input and output files.

6.23.6.4 std::string GoSUM::CEvaluator::in [static], [protected]

6.23.6.5 std::string GoSUM::CEvaluator::out [static], [protected]

6.23.6.6 std::string GoSUM::CEvaluator::path [static], [protected]

6.23.6.7 int GoSUM::CEvaluator::trdN = 1 [static], [protected]

Total number of threads and id of the particular thread this class runs in.

6.23.6.8 enum evaluatortype GoSUM::CEvaluator::type [static], [protected]

Holds type of the evalautor.

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

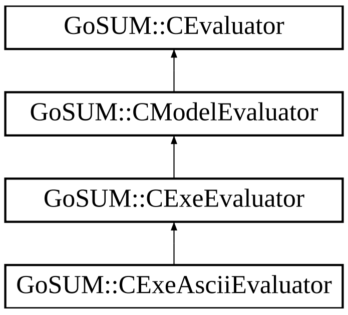
- C:/Development/core/OriginalModel.h
- C:/Development/core/OriginalModel.cpp

6.24 GoSUM::CExeAsciiEvaluator Class Reference

Class for the evaluator with ascii i/o and .exe.

`#include <OriginalModel.h>`

Inheritance diagram for GoSUM::CExeAsciiEvaluator:



Public Member Functions

- CExeAsciiEvaluator ()
- CExeAsciiEvaluator (const CInputParameters ∗_pIP, COutputStates ∗_pOS, int _trdI)
- virtual ∼CExeAsciiEvaluator ()

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

- virtual void writeTo (std::string _fname, const ArrayXd &_X, std::string _Xname)
- virtual void readFrom (std::string _fname, ArrayXd &_Y, std::string _Yname)
- virtual int readSizeFrom (std::string _fname, std::string _Yname)

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.24.1 Detailed Description

Class for the evaluator with ascii i/o and .exe.

6.24.2 Constructor & Destructor Documentation

6.24.2.1 GoSUM::CExeAsciiEvaluator::CExeAsciiEvaluator ( ) [inline]

6.24.2.2 GoSUM::CExeAsciiEvaluator::CExeAsciiEvaluator (const CInputParameters * *_pIP*, COutputStates * *_pOS*, int *_trdl*) [inline]

6.24.2.3 virtual GoSUM::CExeAsciiEvaluator::∼CExeAsciiEvaluator ( ) [inline], [virtual]

6.24.3 Member Function Documentation

6.24.3.1 void GoSUM::CExeAsciiEvaluator::readFrom (std::string *_fname*, ArrayXd & *_Y*, std::string *_Yname*) [protected], [virtual]

Implements GoSUM::CExeEvaluator.

6.24.3.2 int GoSUM::CExeAsciiEvaluator::readSizeFrom (std::string *_fname*, std::string *_Yname*) [protected], [virtual]

Implements GoSUM::CExeEvaluator.

6.24.3.3 template<class Archive > void GoSUM::CExeAsciiEvaluator::serialize (Archive & *ar*, const unsigned int *version*) [protected]

Reimplemented from GoSUM::CExeEvaluator.

6.24.3.4 void GoSUM::CExeAsciiEvaluator::writeTo (std::string *_fname*, const ArrayXd & *_X*, std::string *_Xname*) [protected], [virtual]

Implements GoSUM::CExeEvaluator.

6.24.4 Friends And Related Function Documentation

6.24.4.1 friend class boost::serialization::access [friend]

Boost serialization.

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

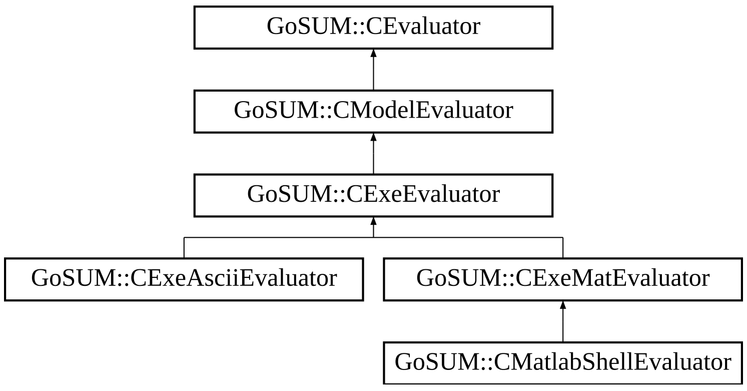
- C:/Development/core/OriginalModel.h
- C:/Development/core/OriginalModel.cpp

6.25 GoSUM::CExeEvaluator Class Reference

Template for the evaluator with some file i/o and .exe derived from CModelEvaluator.

`#include <OriginalModel.h>`

Inheritance diagram for GoSUM::CExeEvaluator:



Public Member Functions

- CExeEvaluator ()
- CExeEvaluator (const CInputParameters ∗_pIP, COutputStates ∗_pOS, int _trdl)
- virtual ∼CExeEvaluator ()
- virtual void openEvaluation ()

  Opens, i.e. prepares evaluation process.
- virtual ArrayXd operator() (const ArrayXd &X)

  Returns output state evaluated on for a single input parameter n-tuple.
- virtual int evaluateOutputsSize ()

  Evaluates outputs size by running model evaluator.
- virtual void closeEvaluation ()

  Closes evaluation process.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- virtual void systemCommand (std::ostringstream &cmd)
- virtual void writeTo (std::string _fname, const ArrayXd &_X, std::string _Xname)=0
- virtual void readFrom (std::string _fname, ArrayXd &_Y, std::string _Yname)=0
- virtual int readSizeFrom (std::string _fname, std::string _Yname)=0

Protected Attributes

- QProcess ∗ pP

  Points to the qprocess.

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.25.1 Detailed Description

Template for the evaluator with some file i/o and .exe derived from CModelEvaluator.

6.25.2 Constructor & Destructor Documentation

6.25.2.1 GoSUM::CExeEvaluator::CExeEvaluator ( ) `[inline]`

6.25.2.2 GoSUM::CExeEvaluator::CExeEvaluator (const CInputParameters * *_pIP*, COutputStates * *_pOS*, int *_trdl*) `[inline]`

6.25.2.3 virtual GoSUM::CExeEvaluator::~CExeEvaluator ( ) `[inline]`, `[virtual]`

6.25.3 Member Function Documentation

6.25.3.1 void GoSUM::CExeEvaluator::closeEvaluation ( ) `[virtual]`

Closes evaluation process.

Implements GoSUM::CModelEvaluator.

6.25.3.2 int GoSUM::CExeEvaluator::evaluateOutputsSize ( ) `[virtual]`

Evaluates outputs size by running model evaluator.

Reimplemented from GoSUM::CModelEvaluator.

6.25.3.3 void GoSUM::CExeEvaluator::openEvaluation ( ) `[virtual]`

Opens, i.e. prepares evaluation process.

Implements GoSUM::CModelEvaluator.

6.25.3.4 ArrayXd GoSUM::CExeEvaluator::operator() (const ArrayXd & *X*) `[virtual]`

Returns output state evaluated on for a single input parameter n-tuple.

Implements GoSUM::CModelEvaluator.

6.25.3.5 virtual void GoSUM::CExeEvaluator::readFrom (std::string *_fname*, ArrayXd & *_Y*, std::string *_Yname*) `[protected]`, `[pure virtual]`

Implemented in GoSUM::CExeMatEvaluator, and GoSUM::CExeAsciiEvaluator.

6.25.3.6 virtual int GoSUM::CExeEvaluator::readSizeFrom (std::string *_fname,* std::string *_Yname*) [protected], [pure virtual]

Implemented in GoSUM::CExeMatEvaluator, and GoSUM::CExeAsciiEvaluator.

6.25.3.7 template<class Archive > void GoSUM::CExeEvaluator::serialize (Archive & *ar,* const unsigned int *version*) [protected]

Reimplemented from GoSUM::CModelEvaluator.

Reimplemented in GoSUM::CMatlabShellEvaluator, GoSUM::CExeMatEvaluator, and GoSUM::CExeAscii-Evaluator.

6.25.3.8 virtual void GoSUM::CExeEvaluator::systemCommand (std::ostringstream & *cmd*) [inline], [protected], [virtual]

Reimplemented in GoSUM::CMatlabShellEvaluator.

6.25.3.9 virtual void GoSUM::CExeEvaluator::writeTo (std::string *_fname,* const ArrayXd & *_X,* std::string *_Xname*) [protected], [pure virtual]

Implemented in GoSUM::CExeMatEvaluator, and GoSUM::CExeAsciiEvaluator.

6.25.4 Friends And Related Function Documentation

6.25.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.25.5 Member Data Documentation

6.25.5.1 QProcess* GoSUM::CExeEvaluator::pP [protected]

Points to the qprocess.

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

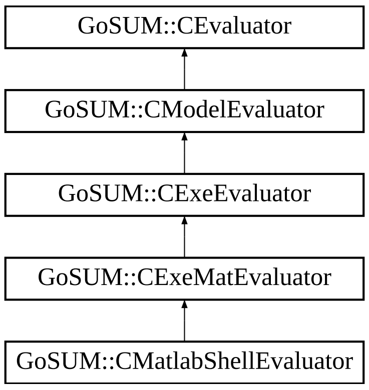
- C:/Development/core/OriginalModel.h
- C:/Development/core/OriginalModel.cpp

6.26 GoSUM::CExeMatEvaluator Class Reference

Class for the evaluator with Matlab .mat i/o and .exe.

`#include <OriginalModel.h>`

Inheritance diagram for GoSUM::CExeMatEvaluator:



Public Member Functions

- CExeMatEvaluator ()
- CExeMatEvaluator (const CInputParameters ∗_pIP, COutputStates ∗_pOS, int _trdl)
- virtual ∼CExeMatEvaluator ()

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- virtual void writeTo (std::string _fname, const ArrayXd &_X, std::string _Xname)
- virtual void readFrom (std::string _fname, ArrayXd &_Y, std::string _Yname)
- virtual int readSizeFrom (std::string _fname, std::string _Yname)

Protected Attributes

- CMATLAB matlab

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.26.1 Detailed Description

Class for the evaluator with Matlab .mat i/o and .exe.

6.26.2 Constructor & Destructor Documentation

6.26.2.1 GoSUM::CExeMatEvaluator::CExeMatEvaluator ( ) [inline]

6.26.2.2 GoSUM::CExeMatEvaluator::CExeMatEvaluator (const CInputParameters ∗ *_pIP*, COutputStates ∗ *_pOS*, int *_trdl*) [inline]

6.26.2.3 virtual GoSUM::CExeMatEvaluator::∼CExeMatEvaluator ( ) [inline], [virtual]

6.26.3 Member Function Documentation

6.26.3.1 void GoSUM::CExeMatEvaluator::readFrom (std::string *_fname,* ArrayXd & *_Y,* std::string *_Yname*) `[protected], [virtual]`

Implements GoSUM::CExeEvaluator.

6.26.3.2 int GoSUM::CExeMatEvaluator::readSizeFrom (std::string *_fname,* std::string *_Yname*) `[protected], [virtual]`

Implements GoSUM::CExeEvaluator.

6.26.3.3 template<class Archive > void GoSUM::CExeMatEvaluator::serialize (Archive & *ar,* const unsigned int *version*) `[protected]`

Reimplemented from GoSUM::CExeEvaluator.

Reimplemented in GoSUM::CMatlabShellEvaluator.

6.26.3.4 void GoSUM::CExeMatEvaluator::writeTo (std::string *_fname,* const ArrayXd & *_X,* std::string *_Xname*) `[protected], [virtual]`

Implements GoSUM::CExeEvaluator.

6.26.4 Friends And Related Function Documentation

6.26.4.1 friend class boost::serialization::access `[friend]`

Boost serialization.

6.26.5 Member Data Documentation

6.26.5.1 CMATLAB GoSUM::CExeMatEvaluator::matlab `[protected]`

Object for matlab library functions.

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

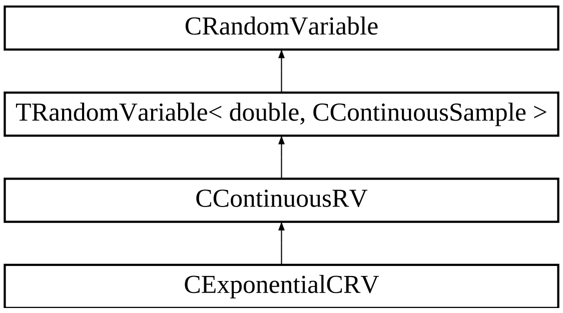
- C:/Development/core/OriginalModel.h
- C:/Development/core/OriginalModel.cpp

6.27 CExponentialCRV Class Reference

Class for exponential continuous random variables derived from continuous random variables.

`#include <RandomVariable.h>`

Inheritance diagram for CExponentialCRV:



Public Member Functions

- CExponentialCRV ()
- virtual ∼CExponentialCRV ()
- CExponentialCRV (const CExponentialCRV &O)
- virtual void setDistribution (double _lambda, double _dp2=0)

  Set distribution parameters.
- virtual void setDistribution (const CContinuousSample &_aS)

  Set distribution parameters from sample empirical parameters.
- virtual double probability (double _x) const

  Function that returns PDF.
- virtual double cumulative (double _x) const

  Function that returns CDF.
- virtual double minValue () const

  Returns minimal value of the random variable.
- virtual double maxValue () const

  Returns maximal value of the random variable.
- virtual double expectedValue () const

  Returns expected value of the random variable.
- virtual distributiontype distributionType () const

  Returns enum type of the random variable distribution.
- virtual std::string distributionName () const

  Returns name of the random variable distribution.
- virtual ArrayXd exportDomain () const

  Exports domain of the random variable.
- double rateParameter () const

  Returns rate parameter of exponential random variable.
- void setRateParameter (double _lambda)

  Sets rate parameter of exponential random variable.
- virtual double variance () const

  Returns variance of the random variable.

Protected Member Functions

- virtual double doQuantile (double _p) const

  Quantile, formula implementation.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- double lambda
- double beta

Friends

- class boost::serialization::access

    Boost serialization.

Additional Inherited Members

6.27.1 Detailed Description

Class for exponential continuous random variables derived from continuous random variables.

6.27.2 Constructor & Destructor Documentation

6.27.2.1 CExponentialCRV::CExponentialCRV ( ) [inline]

6.27.2.2 virtual CExponentialCRV::∼CExponentialCRV ( ) [inline], [virtual]

6.27.2.3 CExponentialCRV::CExponentialCRV (const CExponentialCRV & *O*) [inline]

6.27.3 Member Function Documentation

6.27.3.1 virtual double CExponentialCRV::cumulative (double *_x*) const [inline], [virtual]

Function that returns CDF.

6.27.3.2 virtual std::string CExponentialCRV::distributionName ( ) const [inline], [virtual]

Returns name of the random variable distribution.

Implements CRandomVariable.

6.27.3.3 virtual distributiontype CExponentialCRV::distributionType ( ) const [inline], [virtual]

Returns enum type of the random variable distribution.

Implements CRandomVariable.

6.27.3.4 virtual double CExponentialCRV::doQuantile (double *_p*) const [inline], [protected], [virtual]

Quantile, formula implementation.

Implements CRandomVariable.

6.27.3.5 virtual double CExponentialCRV::expectedValue ( ) const [inline], [virtual]

Returns expected value of the random variable.

Implements CRandomVariable.

6.27.3.6 ArrayXd CExponentialCRV::exportDomain ( ) const [virtual]

Exports domain of the random variable.

Implements TRandomVariable< t, T >.

6.27.3.7 virtual double CExponentialCRV::maxValue ( ) const [inline], [virtual]

Returns maximal value of the random variable.

Implements CRandomVariable.

6.27.3.8 virtual double CExponentialCRV::minValue ( ) const [inline], [virtual]

Returns minimal value of the random variable.

Implements CRandomVariable.

6.27.3.9 virtual double CExponentialCRV::probability (double *_x*) const [inline], [virtual]

Function that returns PDF.

6.27.3.10 double CExponentialCRV::rateParameter ( ) const [inline]

Returns rate parameter of exponential random variable.

6.27.3.11 template<class Archive > void CExponentialCRV::serialize (Archive & *ar,* const unsigned int *version*) [private]

6.27.3.12 void CExponentialCRV::setDistribution (double *_lambda,* double *_dp2* = 0) [virtual]

Set distribution parameters.

6.27.3.13 virtual void CExponentialCRV::setDistribution (const CContinuousSample & *_aS*) [inline], [virtual]

Set distribution parameters from sample empirical parameters.

6.27.3.14 void CExponentialCRV::setRateParameter (double *_lambda*) [inline]

Sets rate parameter of exponential random variable.

6.27.3.15 virtual double CExponentialCRV::variance ( ) const [inline], [virtual]

Returns variance of the random variable.

Implements CRandomVariable.

6.27.4 Friends And Related Function Documentation

6.27.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.27.5 Member Data Documentation

6.27.5.1 double CExponentialCRV::beta `[private]`

Distribution parameters: rate parameter beta=1/lambda.

6.27.5.2 double CExponentialCRV::lambda `[private]`

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

- C:/Development/core/RandomVariable.h
- C:/Development/core/RandomVariable.cpp

6.28 CFFTW Class Reference

Class interface for FFTW's libfftw library.

`#include <FFTWLibrary.h>`

Public Member Functions

- CFFTW ()
- virtual ∼CFFTW ()
- ArrayXd discreteCosineTransform (const ArrayXd &in)

  Computes discrete cosine transform using fftw.
- ArrayXd inverseDiscreteCosineTransform (const ArrayXd &in)

  Computes inverse discrete cosine transform using fftw.

6.28.1 Detailed Description

Class interface for FFTW's libfftw library.

6.28.2 Constructor & Destructor Documentation

6.28.2.1 CFFTW::CFFTW ( ) `[inline]`

6.28.2.2 virtual CFFTW::∼CFFTW ( ) `[inline]`, `[virtual]`

6.28.3 Member Function Documentation

6.28.3.1 ArrayXd CFFTW::discreteCosineTransform (const ArrayXd & *in*)

Computes discrete cosine transform using fftw.

6.28.3.2 ArrayXd CFFTW::inverseDiscreteCosineTransform (const ArrayXd & *in*)

Computes inverse discrete cosine transform using fftw.

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

- C:/Development/core/FFTWLibrary.h
- C:/Development/core/FFTWLibrary.cpp

6.29 CGAModelOptimization Class Reference

Class for the genetic algorithm, i.e. interface for GALIB.

```
#include <GAOptimization.h>
```

Public Member Functions

- CGAModelOptimization ()
- virtual ∼CGAModelOptimization ()
- ArrayXd optimize (COptimizationProblem ∗_pSOP, std::ostream &_out=std::cout)

  Solves the optimizations problem.
- int progressStepsSize () const

  Returns progress steps size.
- int populationSize () const

  Returns population size.
- void setPopulationSize (int _popsize)

  Sets population size.

Static Public Member Functions

- static ArrayXd GAGenome2ArrayXd (const GAGenome &g)

  Converts GAGenome -> hpyercube point.
- static float Fitness (GAGenome &g)

  Evalutes fitness of an individual.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Protected Attributes

- int popsize
- ArrayXd Xbest
- double ybest

Static Protected Attributes

- static COptimizationProblem ∗ pOP = NULL

  Points to the optimization problem.
- static double C = 1.e+2

  Constant added to get positive fitness.

Friends

- class boost::serialization::access

  Boost serialization.

6.29.1 Detailed Description

Class for the genetic algorithm, i.e. interface for GALIB.

6.29.2 Constructor & Destructor Documentation

6.29.2.1 CGAModelOptimization::CGAModelOptimization ( ) [inline]

6.29.2.2 virtual CGAModelOptimization::∼CGAModelOptimization ( ) [inline], [virtual]

6.29.3 Member Function Documentation

6.29.3.1 float CGAModelOptimization::Fitness (GAGenome & *g*) [static]

Evalutes fitness of an individual.

6.29.3.2 ArrayXd CGAModelOptimization::GAGenome2ArrayXd (const GAGenome & *g*) [static]

Converts GAGenome -> hpyercube point.

6.29.3.3 ArrayXd CGAModelOptimization::optimize (COptimizationProblem ∗ *_pSOP,* std::ostream & *_out =* std::cout)

Solves the optimizations problem.

6.29.3.4 int CGAModelOptimization::populationSize ( ) const [inline]

Returns population size.

6.29.3.5 int CGAModelOptimization::progressStepsSize ( ) const [inline]

Returns progress steps size.

6.29.3.6 template<class Archive > void CGAModelOptimization::serialize (Archive & *ar,* const unsigned int *version*) [protected]

6.29.3.7 void CGAModelOptimization::setPopulationSize (int *_popsize*) [inline]

Sets population size.

6.29.4 Friends And Related Function Documentation

6.29.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.29.5 Member Data Documentation

6.29.5.1 double CGAModelOptimization::C = 1.e+2 [static], [protected]

Constant added to get positive fitness.

6.29.5.2 COptimizationProblem ∗ CGAModelOptimization::pOP = NULL [static], [protected]

Points to the optimization problem.

6.29.5.3 int CGAModelOptimization::popsize [protected]

6.29.5.4 ArrayXd CGAModelOptimization::Xbest [protected]

6.29.5.5 double CGAModelOptimization::ybest [protected]

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

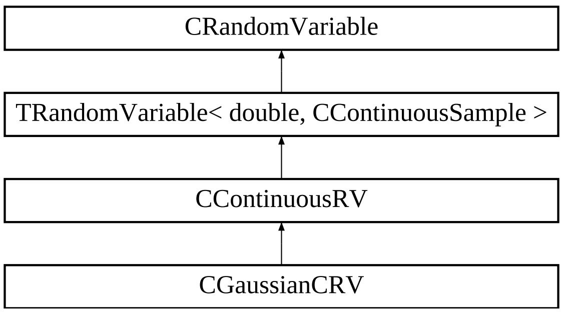
- C:/Development/core/GAOptimization.h
- C:/Development/core/GAOptimization.cpp

6.30 CGaussianCRV Class Reference

Class for Gaussian continuous random variables derived from continuous random variables.

`#include <RandomVariable.h>`

Inheritance diagram for CGaussianCRV:



Public Member Functions

- CGaussianCRV ()
- virtual ∼CGaussianCRV ()
- CGaussianCRV (const CGaussianCRV &O)
- virtual void setDistribution (double _mu, double _sigma)

  Set distribution parameters.
- virtual void setDistribution (const CContinuousSample &_aS)

  Set distribution parameters from sample empirical parameters.
- virtual double probability (double _x) const

  Function that returns PDF.
- virtual double cumulative (double _x) const

  Function that returns CDF.
- virtual double minValue () const

  Returns minimal value of the random variable.
- virtual double maxValue () const

  Returns maximal value of the random variable.
- virtual double expectedValue () const

  Returns expected value of the random variable.

- virtual distributiontype distributionType () const

  Returns enum type of the random variable distribution.
- virtual std::string distributionName () const

  Returns name of the random variable distribution.
- virtual ArrayXd exportDomain () const

  Exports domain of the random variable.
- double mean () const

  Returns mean of Gaussian random variable.
- double standardDeviation () const

  Returns standard deviation of Gaussian random variable.
- void setMean (double _mu)

  Sets mean of Gaussian random variable.
- void setStandardDeviation (double _sigma)

  Sets standard deviation of Gaussian random variable.
- virtual double variance () const

  Returns variance of the random variable.

Protected Member Functions

- virtual double doQuantile (double _p) const

  Quantile, formula implementation.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- double mu
- double sigma
- double sigma2
- double sigmasqrt2

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.30.1 Detailed Description

Class for Gaussian continuous random variables derived from continuous random variables.

6.30.2 Constructor & Destructor Documentation

6.30.2.1 CGaussianCRV::CGaussianCRV ( ) [inline]

6.30.2.2 virtual CGaussianCRV::∼CGaussianCRV ( ) [inline], [virtual]

6.30.2.3 CGaussianCRV::CGaussianCRV (const CGaussianCRV & *O*) [inline]

6.30.3 Member Function Documentation

6.30.3.1 virtual double CGaussianCRV::cumulative (double *_x*) const [inline], [virtual]

Function that returns CDF.

6.30.3.2 virtual std::string CGaussianCRV::distributionName ( ) const [inline], [virtual]

Returns name of the random variable distribution.

Implements CRandomVariable.

6.30.3.3 virtual distributiontype CGaussianCRV::distributionType ( ) const [inline], [virtual]

Returns enum type of the random variable distribution.

Implements CRandomVariable.

6.30.3.4 virtual double CGaussianCRV::doQuantile (double *_p*) const [inline], [protected], [virtual]

Quantile, formula implementation.

Implements CRandomVariable.

6.30.3.5 virtual double CGaussianCRV::expectedValue ( ) const [inline], [virtual]

Returns expected value of the random variable.

Implements CRandomVariable.

6.30.3.6 ArrayXd CGaussianCRV::exportDomain ( ) const [virtual]

Exports domain of the random variable.

Implements TRandomVariable< t, T >.

6.30.3.7 virtual double CGaussianCRV::maxValue ( ) const [inline], [virtual]

Returns maximal value of the random variable.

Implements CRandomVariable.

6.30.3.8 double CGaussianCRV::mean ( ) const [inline]

Returns mean of Gaussian random variable.

6.30.3.9 virtual double CGaussianCRV::minValue ( ) const [inline], [virtual]

Returns minimal value of the random variable.

Implements CRandomVariable.

6.30.3.10 virtual double CGaussianCRV::probability (double _x) const [inline], [virtual]

Function that returns PDF.

6.30.3.11 template<class Archive > void CGaussianCRV::serialize (Archive & *ar*, const unsigned int *version*) [private]

6.30.3.12 void CGaussianCRV::setDistribution (double _*mu*, double _*sigma*) [virtual]

Set distribution parameters.

6.30.3.13 virtual void CGaussianCRV::setDistribution (const CContinuousSample & _*aS*) [inline], [virtual]

Set distribution parameters from sample empirical parameters.

6.30.3.14 void CGaussianCRV::setMean (double _*mu*) [inline]

Sets mean of Gaussian random variable.

6.30.3.15 void CGaussianCRV::setStandardDeviation (double _*sigma*) [inline]

Sets standard deviation of Gaussian random variable.

6.30.3.16 double CGaussianCRV::standardDeviation ( ) const [inline]

Returns standard deviation of Gaussian random variable.

6.30.3.17 virtual double CGaussianCRV::variance ( ) const [inline], [virtual]

Returns variance of the random variable.

Implements CRandomVariable.

6.30.4 Friends And Related Function Documentation

6.30.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.30.5 Member Data Documentation

6.30.5.1 double CGaussianCRV::mu [private]

6.30.5.2 double CGaussianCRV::sigma [private]

6.30.5.3 double CGaussianCRV::sigma2 `[private]`

6.30.5.4 double CGaussianCRV::sigmasqrt2 `[private]`

Distribution parameters: mean (mu) and standard deviation (sigma).

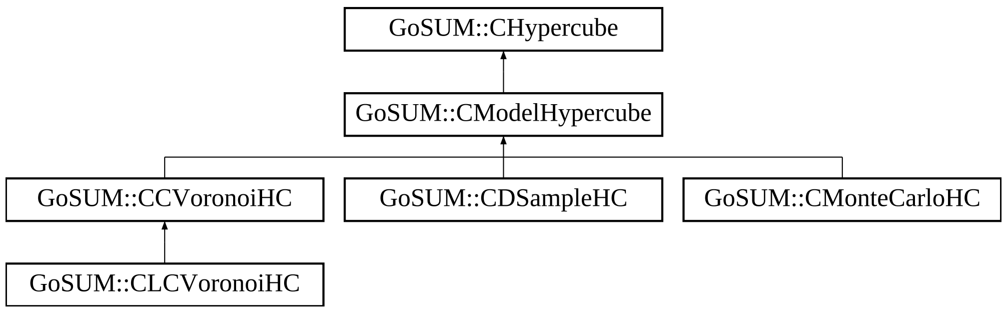
The documentation for this class was generated from the following files:

- C:/Development/core/RandomVariable.h
- C:/Development/core/RandomVariable.cpp

6.31 GoSUM::CHypercube Class Reference

`#include <Hypercube.h>`

Inheritance diagram for GoSUM::CHypercube:



Public Types

- enum hctype { dsample, montecarlo, cvoronoi, lcvoronoi }

Public Member Functions

- CHypercube ()
- virtual ∼CHypercube ()

Static Public Member Functions

- static hctype Type (const std::string &_stype)

  Returns hypercube type enumerator from hypercube type name.
- static hctype Type ()

  Returns hypercube type.
- static void SetType (hctype _etype)

  Sets hypercube type.
- static void VoronoiOptions (int &_maxiter, int &_q, double &_alpha2, double &_beta2)
- static void SetVoronoiOptions (int _maxiter, int _q, double _alpha2, double _beta2)
- static int CvtIterationSize ()

  Returns CVT iteration size.
- static void SetCvtIterationSize (int _maxiter)

  Sets CVT iteration size.
- static int CvtPointsSize ()

Returns CVT points size.
- static void SetCvtPointsSize (int _q)

  Sets CVT points size.
- static double CvtOldCenterCoefficient ()

  Returns CVT parameter #1.
- static void SetCvtOldCenterCoefficient (double _alpha2)

  Sets CVT paramter #1.
- static double CvtNewCenterCoefficient ()

  Returns CVT paramter #2.
- static void SetCvtNewCenterCoefficient (double _beta2)

  Sets CVT paramter #2.
- static GoSUM::CModelHypercube ∗ New (CInputParameters ∗_pIP)

  Returns new model hypercube.
- static int ProgressSize (int _rssize, int _dim)

  Returns progress steps size.

Public Attributes

- boost::signal< void()> generatingProgressed

  Signal for centralize progress.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Static Protected Attributes

- static hctype etype = GoSUM::CHypercube::dsample

  Holds hypercube type.
- static int maxiter = 10000
- static int q = 1

  Holds CVT parameters.
- static double alpha2 = 0.
- static double beta2 = 1.

Friends

- class boost::serialization::access

  Boost serialization.

6.31.1 Member Enumeration Documentation

6.31.1.1 enum GoSUM::CHypercube::hctype

Enumerator:

dsample

montecarlo

cvoronoi

lcvoronoi

6.31.2 Constructor & Destructor Documentation

6.31.2.1 GoSUM::CHypercube::CHypercube ( ) [inline]

6.31.2.2 virtual GoSUM::CHypercube::∼CHypercube ( ) [inline], [virtual]

6.31.3 Member Function Documentation

6.31.3.1 static int GoSUM::CHypercube::CvtIterationSize ( ) [inline], [static]

Returns CVT iteration size.

6.31.3.2 static double GoSUM::CHypercube::CvtNewCenterCoefficient ( ) [inline], [static]

Returns CVT paramter #2.

6.31.3.3 static double GoSUM::CHypercube::CvtOldCenterCoefficient ( ) [inline], [static]

Returns CVT parameter #1.

6.31.3.4 static int GoSUM::CHypercube::CvtPointsSize ( ) [inline], [static]

Returns CVT points size.

6.31.3.5 GoSUM::CModelHypercube ∗ GoSUM::CHypercube::New (CInputParameters ∗ _pIP) [static]

Returns new model hypercube.

6.31.3.6 int GoSUM::CHypercube::ProgressSize (int _rssize, int _dim) [static]

Returns progress steps size.

6.31.3.7 template<class Archive > void GoSUM::CHypercube::serialize (Archive & ar, const unsigned int version) [protected]

Reimplemented in GoSUM::CLCVoronoiHC, GoSUM::CCVoronoiHC, GoSUM::CMonteCarloHC, and GoSUM::C-ModelHypercube.

6.31.3.8 static void GoSUM::CHypercube::SetCvtIterationSize (int _maxiter) [inline], [static]

Sets CVT iteration size.

6.31.3.9 static void GoSUM::CHypercube::SetCvtNewCenterCoefficient (double _beta2) [inline], [static]

Sets CVT paramter #2.

6.31.3.10 static void GoSUM::CHypercube::SetCvtOldCenterCoefficient (double _alpha2) [inline], [static]

Sets CVT paramter #1.

6.31.3.11 static void GoSUM::CHypercube::SetCvtPointsSize (int *_q*) [inline], [static]

Sets CVT points size.

6.31.3.12 void GoSUM::CHypercube::SetType (hctype *_etype*) [static]

Sets hypercube type.

6.31.3.13 static void GoSUM::CHypercube::SetVoronoiOptions (int *_maxiter*, int *_q*, double *_alpha2*, double *_beta2*) [inline], [static]

Parameters

_beta2	Sets Voronoi options.

6.31.3.14 GoSUM::CHypercube::hctype GoSUM::CHypercube::Type (const std::string & *_stype*) [static]

Returns hypercube type enumerator from hypercube type name.

6.31.3.15 static hctype GoSUM::CHypercube::Type ( ) [inline], [static]

Returns hypercube type.

6.31.3.16 static void GoSUM::CHypercube::VoronoiOptions (int & *_maxiter*, int & *_q*, double & *_alpha2*, double & *_beta2*) [inline], [static]

Parameters

_beta2	Returns Voronoi options.

6.31.4 Friends And Related Function Documentation

6.31.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.31.5 Member Data Documentation

6.31.5.1 double GoSUM::CHypercube::alpha2 = 0. [static], [protected]

6.31.5.2 double GoSUM::CHypercube::beta2 = 1. [static], [protected]

Holds CVT parameters.

6.31.5.3 GoSUM::CHypercube::hctype GoSUM::CHypercube::etype = GoSUM::CHypercube::dsample [static], [protected]

Holds hypercube type.

6.31.5.4 boost::signal< void()> GoSUM::CHypercube::generatingProgressed

Signal for centralize progress.

6.31.5.5 int GoSUM::CHypercube::maxiter = 10000 `[static], [protected]`

6.31.5.6 int GoSUM::CHypercube::q = 1 `[static], [protected]`

Holds CVT parameters.

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

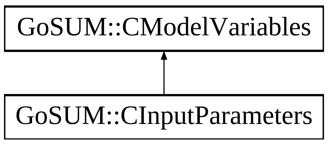
- C:/Development/core/Hypercube.h
- C:/Development/core/Hypercube.cpp

6.32 GoSUM::CInputParameters Class Reference

Class for GoSUM input parameters.

`#include <Model.h>`

Inheritance diagram for GoSUM::CInputParameters:



Public Member Functions

- CInputParameters (CModelConstraints ∗_pIC)
- virtual ∼CInputParameters ()
- int resampleSize () const

    Returns resampling size.
- void setResampleSize (int _RSsize)

    Sets resampling size.
- void generateSamples (std::vector< ArrayXd > &_samples)

    Generates samples on external vector of samples.
- void generateSamples ()

    Generates samples on internal model variable samples.
- int resampleStepsSize () const

    Returns resample steps size.
- CModelConstraints ∗ constraints () const

    Returns pointer to model constraints.
- void setProgressSlot (boost::function< void()> _progressSlot)

    Sets external progress slot.

Public Attributes

- boost::function< void()> progressSlot

    External progress slot, later connected to signal for evalaution progress.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- CInputParameters ()

Private Attributes

- CModelConstraints ∗ pIC

  Points to model constraints.
- int RSsize

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.32.1 Detailed Description

Class for GoSUM input parameters.

6.32.2 Constructor & Destructor Documentation

6.32.2.1 GoSUM::CInputParameters::CInputParameters ( ) [inline], [private]

6.32.2.2 GoSUM::CInputParameters::CInputParameters (**CModelConstraints** ∗ *_pIC*) [inline]

6.32.2.3 virtual GoSUM::CInputParameters::∼CInputParameters ( ) [inline], [virtual]

6.32.3 Member Function Documentation

6.32.3.1 CModelConstraints∗ GoSUM::CInputParameters::constraints ( ) const [inline]

Returns pointer to model constraints.

6.32.3.2 void GoSUM::CInputParameters::generateSamples (std::vector< ArrayXd > & *_samples*)

Generates samples on external vector of samples.

6.32.3.3 void GoSUM::CInputParameters::generateSamples ( )

Generates samples on internal model variable samples.

6.32.3.4 int GoSUM::CInputParameters::resampleSize ( ) const [inline]

Returns resampling size.

6.32.3.5 int GoSUM::CInputParameters::resampleStepsSize ( ) const

Returns resample steps size.

6.32.3.6 template<class Archive > void GoSUM::CInputParameters::serialize (Archive & *ar*, const unsigned int *version*) [private]

6.32.3.7 void GoSUM::CInputParameters::setProgressSlot (boost::function< void()> *_progressSlot*) [inline]

Sets external progress slot.

6.32.3.8 void GoSUM::CInputParameters::setResampleSize (int *_RSsize*) [inline]

Sets resampling size.

6.32.4 Friends And Related Function Documentation

6.32.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.32.5 Member Data Documentation

6.32.5.1 CModelConstraints∗ GoSUM::CInputParameters::pIC [private]

Points to model constraints.

6.32.5.2 boost::function<void()> GoSUM::CInputParameters::progressSlot

External progress slot, later connected to signal for evalaution progress.

6.32.5.3 int GoSUM::CInputParameters::RSsize [private]

Holds resample size.

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

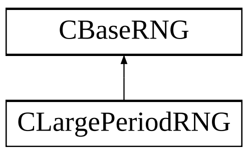
- C:/Development/core/Model.h
- C:/Development/core/Model.cpp

6.33 CLargePeriodRNG Class Reference

Class for uniform RNG with large period = 3.138∗10^57.

`#include <RandomGenerators.h>`

Inheritance diagram for CLargePeriodRNG:



Public Member Functions

- CLargePeriodRNG ()
- CLargePeriodRNG (unsigned int s)
- virtual ~CLargePeriodRNG ()
- virtual void setSeed (unsigned int s)

  Sets seed of the RNG.
- virtual unsigned int rndi ()

  Returns randomly generated unsigned int.
- virtual double rnd ()

  Returns randomly generated double between 0 and 1.

Private Types

- typedef unsigned long long int Ullong

Private Member Functions

- Ullong int64 ()

Private Attributes

- Ullong u
- Ullong v
- Ullong w

  Parameters of the large period RNG.

6.33.1 Detailed Description

Class for uniform RNG with large period = 3.138∗10^57.

6.33.2 Member Typedef Documentation

6.33.2.1 typedef unsigned long long int **CLargePeriodRNG::Ullong** [private]

6.33.3 Constructor & Destructor Documentation

6.33.3.1 CLargePeriodRNG::CLargePeriodRNG ( ) [inline]

6.33.3.2 CLargePeriodRNG::CLargePeriodRNG (unsigned int *s*) [inline]

6.33.3.3 virtual CLargePeriodRNG::~CLargePeriodRNG ( ) [inline], [virtual]

6.33.4 Member Function Documentation

6.33.4.1 **Ullong** CLargePeriodRNG::int64 ( ) [inline], [private]

6.33.4.2 virtual double CLargePeriodRNG::rnd ( ) [inline], [virtual]

Returns randomly generated double between 0 and 1.

Implements CBaseRNG.

6.33.4.3 virtual unsigned int CLargePeriodRNG::rndi ( ) [inline], [virtual]

Returns randomly generated unsigned int.

Implements CBaseRNG.

6.33.4.4 virtual void CLargePeriodRNG::setSeed (unsigned int *s*) [inline], [virtual]

Sets seed of the RNG.

Parameters

s	Sets seed of the RNG.

Implements CBaseRNG.

6.33.5 Member Data Documentation

6.33.5.1 Ullong CLargePeriodRNG::u [private]

6.33.5.2 Ullong CLargePeriodRNG::v [private]

6.33.5.3 Ullong CLargePeriodRNG::w [private]

Parameters of the large period RNG.

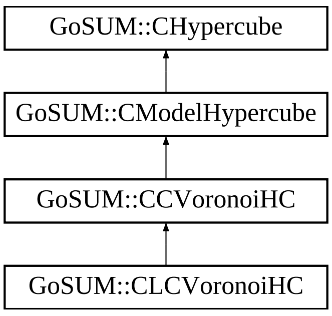
The documentation for this class was generated from the following file:

- C:/Development/core/RandomGenerators.h

6.34 GoSUM::CLCVoronoiHC Class Reference

`#include <Hypercube.h>`

Inheritance diagram for GoSUM::CLCVoronoiHC:



Public Member Functions

- CLCVoronoiHC (CInputParameters ∗_pIP)
- virtual ∼CLCVoronoiHC ()

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- virtual void doGenerate (int _rssize, int _dim, std::vector< ArrayXd > &_samples)

  Core of the generation.
- void latinize (std::vector< ArrayXd > &_samples)

  Latinizes model points _samples.
- CLCVoronoiHC ()

Static Protected Member Functions

- static bool compcoo (ArrayXd &a, ArrayXd &b)

Static Protected Attributes

- static int coo

  Used in compcoo.

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.34.1 Constructor & Destructor Documentation

6.34.1.1 GoSUM::CLCVoronoiHC::CLCVoronoiHC ( ) `[inline], [protected]`

6.34.1.2 GoSUM::CLCVoronoiHC::CLCVoronoiHC (**CInputParameters** ∗ *_pIP*) `[inline]`

6.34.1.3 virtual GoSUM::CLCVoronoiHC::∼CLCVoronoiHC ( ) `[inline], [virtual]`

6.34.2 Member Function Documentation

6.34.2.1 static bool GoSUM::CLCVoronoiHC::compcoo (ArrayXd & *a*, ArrayXd & *b*) `[inline], [static], [protected]`

Compare points by coo cordinate value.

6.34.2.2 void GoSUM::CLCVoronoiHC::doGenerate (int *_rssize*, int *_dim*, std::vector< ArrayXd > & *_samples*) `[protected], [virtual]`

Core of the generation.

Reimplemented from GoSUM::CCVoronoiHC.

6.34.2.3 void GoSUM::CLCVoronoiHC::latinize (std::vector< ArrayXd > & *_samples*) `[protected]`

Latinizes model points _samples.

6.34.2.4 template<class Archive > void GoSUM::CLCVoronoiHC::serialize (Archive & *ar*, const unsigned int *version*) [protected]

Reimplemented from GoSUM::CCVoronoiHC.

6.34.3 Friends And Related Function Documentation

6.34.3.1 friend class boost::serialization::access [friend]

Boost serialization.

6.34.4 Member Data Documentation

6.34.4.1 int GoSUM::CLCVoronoiHC::coo [static], [protected]

Used in compcoo.

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

- C:/Development/core/Hypercube.h
- C:/Development/core/Hypercube.cpp

6.35 CMADS Class Reference

Class for the mesh addaptive direct serach, i.e. interface for NOMAD.

`#include <MADSOptimization.h>`

Public Member Functions

- CMADS ()
- virtual ∼CMADS ()
- ArrayXd optimize (COptimizationProblem ∗_pOP, std::ostream &_out=std::cout)

    Solves the optimizations problem.
- int evaluationSize () const

    Returns maximal number of evaluations.
- void setEvaluationSize (int _maxeval)

    Sets maximal number of evaluations.
- int initialLHSearch () const

    Returns initial value for LH search.
- void setInitialLHSearch (int _lh0)

    Sets initial value for LH search.
- int iterationLHSearch () const

    Returns iteration value for LH search.
- void setIterationLHSearch (int _lhi)

    Sets iteration value for LH search.
- double initalMeshSize () const

    Returns initial mesh size factor.
- void setInitialMeshSize (double _ims)

    Sets initial mesh size factor.
- double minimalPollSize () const

Returns minimal poll size factor.
- void setMinimalPollSize (double _mps)

  Sets minimal poll size factor.
- int progressStepsSize () const

  Returns progress steps size.

Static Public Member Functions

- static NOMAD::Point ArrayXd2NOMADPoint (const ArrayXd &x)

  Utility: converts ArrayXd to NOMAD::Point.
- static ArrayXd NOMADPoint2ArrayXd (const NOMAD::Point &p)

  Utility: converts NOMAD::Point to ArrayXd.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Protected Attributes

- COptimizationProblem ∗ pOP

  Points to the optimization problem.
- int maxeval

  Holds maximal number of objective & constraints evaluations during optimization.
- int lh0
- int lhi
- double ims
- double mps
- ArrayXd Xbest
- double ybest

Friends

- class boost::serialization::access

  Boost serialization.

6.35.1 Detailed Description

Class for the mesh addaptive direct serach, i.e. interface for NOMAD.

6.35.2 Constructor & Destructor Documentation

6.35.2.1 CMADS::CMADS ( ) [inline]

6.35.2.2 virtual CMADS::∼CMADS ( ) [inline], [virtual]

6.35.3 Member Function Documentation

6.35.3.1 NOMAD::Point CMADS::ArrayXd2NOMADPoint (const ArrayXd & *x*) [static]

Utility: converts ArrayXd to NOMAD::Point.

6.35.3.2 int CMADS::evaluationSize ( ) const [inline]

Returns maximal number of evaluations.

6.35.3.3 double CMADS::initalMeshSize ( ) const [inline]

Returns initial mesh size factor.

6.35.3.4 int CMADS::initialLHSearch ( ) const [inline]

Returns initial value for LH search.

6.35.3.5 int CMADS::iterationLHSearch ( ) const [inline]

Returns iteration value for LH search.

6.35.3.6 double CMADS::minimalPollSize ( ) const [inline]

Returns minimal poll size factor.

6.35.3.7 ArrayXd CMADS::NOMADPoint2ArrayXd (const NOMAD::Point & *p*) [static]

Utility: converts NOMAD::Point to ArrayXd.

6.35.3.8 ArrayXd CMADS::optimize (COptimizationProblem ∗ *_pOP,* std::ostream & *_out =* `std::cout`)

Solves the optimizations problem.

6.35.3.9 int CMADS::progressStepsSize ( ) const [inline]

Returns progress steps size.

6.35.3.10 template<class Archive > void CMADS::serialize (Archive & *ar,* const unsigned int *version*) [protected]

6.35.3.11 void CMADS::setEvaluationSize (int *_maxeval*) [inline]

Sets maximal number of evaluations.

6.35.3.12 void CMADS::setInitialLHSearch (int *_lh0*) [inline]

Sets initial value for LH search.

6.35.3.13 void CMADS::setInitialMeshSize (double *_ims*) [inline]

Sets initial mesh size factor.

6.35.3.14 void CMADS::setIterationLHSearch (int *_lhi*) [inline]

Sets iteration value for LH search.

6.35.3.15 void CMADS::setMinimalPollSize (double _mps) [inline]

Sets minimal poll size factor.

6.35.4 Friends And Related Function Documentation

6.35.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.35.5 Member Data Documentation

6.35.5.1 double CMADS::ims [protected]

6.35.5.2 int CMADS::lh0 [protected]

6.35.5.3 int CMADS::lhi [protected]

6.35.5.4 int CMADS::maxeval [protected]

Holds maximal number of objective & constraints evaluations during optimization.

6.35.5.5 double CMADS::mps [protected]

6.35.5.6 COptimizationProblem∗ CMADS::pOP [protected]

Points to the optimization problem.

6.35.5.7 ArrayXd CMADS::Xbest [protected]

6.35.5.8 double CMADS::ybest [protected]

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

- C:/Development/core/MADSOptimization.h
- C:/Development/core/MADSOptimization.cpp

6.36 CMADSEvaluator Class Reference

Subclass of the NOMAD::Evaluator class.

`#include <MADSOptimization.h>`

Public Member Functions

- CMADSEvaluator (const NOMAD::Parameters &p, COptimizationProblem ∗_pOP)
- virtual ∼CMADSEvaluator ()
- virtual bool eval_x (NOMAD::Eval_Point &x, const NOMAD::Double &h_max, bool &count_eval) const

  Overload of the NOMAD::Evaluator evaluation member function.

Protected Attributes

- COptimizationProblem ∗ pOP

  Points to the optimization problem.

6.36.1 Detailed Description

Subclass of the NOMAD::Evaluator class.

6.36.2 Constructor & Destructor Documentation

6.36.2.1 CMADSEvaluator::CMADSEvaluator (const NOMAD::Parameters & *p*, COptimizationProblem ∗ *_pOP*) `[inline]`

6.36.2.2 virtual CMADSEvaluator::∼CMADSEvaluator ( ) `[inline]`, `[virtual]`

6.36.3 Member Function Documentation

6.36.3.1 bool CMADSEvaluator::eval_x (NOMAD::Eval_Point & *x*, const NOMAD::Double & *h_max*, bool & *count_eval*) const `[virtual]`

Overload of the NOMAD::Evaluator evaluation member function.

6.36.4 Member Data Documentation

6.36.4.1 COptimizationProblem∗ CMADSEvaluator::pOP `[protected]`

Points to the optimization problem.

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

- C:/Development/core/MADSOptimization.h
- C:/Development/core/MADSOptimization.cpp

6.37 CMATLAB Class Reference

Class interface for Matlab's libmat and libmx dynamic libraries.

`#include <MatlabLibrary.h>`

Public Member Functions

- CMATLAB ()
- virtual ∼CMATLAB ()
- MATFile ∗ matOpen (const string &filename, const string &mode)

  Opens mat file using libmat.
- bool matClose (MATFile ∗pmat)

  Closes mat file using libmat.
- bool matPutVariable (MATFile ∗pmat, const string &name, const mxArray ∗pa)

  Puts variable in mat file using libmat.
- mxArray ∗ matGetVariable (MATFile ∗pmat, const string &name)

  Gets variable from mat file using libmat.

- mxArray ∗ mxCreateDoubleMatrix (int N, int M)

    Creats double matrix using libmx.
- void mxDestroyArray (mxArray ∗pa)

    Destroys array using libmx.
- int mxGetNumberOfElements (mxArray ∗pa)

    Returns number of ements in mxArray using libmx.
- double ∗ mxGetPr (mxArray ∗pa)

    Sets data in double matrix using libmx.
- Engine ∗ engOpenSingleUse (const char ∗startcmd)

    Opens engine for single use.
- Engine ∗ engOpen (const string &startcmd)

    Opens engine.
- int engClose (Engine ∗ep)

    Closes engine.
- int engGetVisible (Engine ∗ep, bool ∗bVal)

    Gets if engine is (in)visible.
- int engSetVisible (Engine ∗ep, bool newVal)

    Sets engine to (in)visible.
- int engEvalString (Engine ∗ep, const string &str)

    Gives to engine a string to evaluate.
- mxArray ∗ engGetVariable (Engine ∗ep, const string &name)

    Gets variable from engine.
- int engPutVariable (Engine ∗ep, const string &var_name, const mxArray ∗ap)

    Puts variable into engine.
- int engOutputBuffer (Engine ∗ep, char ∗buffer, int buflen)

    Sets engines output buffer.
- void matPut (string filename, const ArrayXd &X, string Xname)

    Puts 1 array to .mat file.
- void matGet (string filename, ArrayXd &X, string Xname)

    gets 1 array from .mat file.

Static Public Member Functions

- static void SetPath (const std::string &_path)

    Sets path to the matlab lib.
- static std::string & Path ()

    Returns path to the matlab lib.

Static Public Attributes

- static std::string path = "C:\\Program Files\\MATLAB\\R2010b\\bin\\win64"

    Path to the matlab lib.

Private Attributes

- QLibrary libmat

    QLibrary for libmat.
- QLibrary libmx

    QLibrary for libmx.
- QLibrary libeng

QLibrary for libeng.

- matftype1 pMatOpen

  Reference to matOpen function from libmat.
- matftype2 pMatClose

  Reference to matClose function from libmat.
- matftype3 pMatPutVariable

  Reference to matPutVariable function from libmat.
- matftype4 pMatGetVariable

  Reference to matGetVariable function from libmat.
- mxftype1 pMxCreateDoubleMatrix

  Reference to mxCreateDoubleMatrix function from libmx.
- mxftype2 pMxDestroyArray

  Reference to mxDestroyArray function from libmx.
- mxftype3 pMxGetPr

  Reference to mxGetPr function from libmx.
- mxftype4 pMxSetPr

  Reference to mxSetPr function from libmx.
- mxftype5 pMxGetNumberOfElements

  Reference to mxSetPr function from libmx.
- engftype1 pEngOpenSingleUse

  Reference to engOpenSingleUse function from libeng.
- engftype2 pEngOpen

  Reference to engOpen function from libeng.
- engftype3 pEngClose

  Reference to engClose function from libeng.
- engftype4 pEngGetVisible

  Reference to engGetVisible function from libeng.
- engftype5 pEngSetVisible

  Reference to engSetVisible function from libeng.
- engftype6 pEngEvalString

  Reference to engEvalString function from libeng.
- engftype7 pEngGetVariable

  Reference to engGetVariable function from libeng.
- engftype8 pEngPutVariable

  Reference to engPutVariable function from libeng.
- engftype9 pEngOutputBuffer

  Reference to engOutputBuffer function from libeng.

6.37.1 Detailed Description

Class interface for Matlab's libmat and libmx dynamic libraries.

6.37.2 Constructor & Destructor Documentation

6.37.2.1 CMATLAB::CMATLAB ( )

6.37.2.2 virtual CMATLAB::∼CMATLAB ( ) `[inline], [virtual]`

6.37.3 Member Function Documentation

6.37.3.1 int CMATLAB::engClose (Engine ∗ *ep*) `[inline]`

Closes engine.

6.37.3.2 int CMATLAB::engEvalString (Engine ∗ *ep*, const string & *str*) `[inline]`

Gives to engine a string to evaluate.

6.37.3.3 mxArray∗ CMATLAB::engGetVariable (Engine ∗ *ep*, const string & *name*) `[inline]`

Gets variable from engine.

6.37.3.4 int CMATLAB::engGetVisible (Engine ∗ *ep*, bool ∗ *bVal*) `[inline]`

Gets if engine is (in)visible.

6.37.3.5 Engine∗ CMATLAB::engOpen (const string & *startcmd*) `[inline]`

Opens engine.

6.37.3.6 Engine∗ CMATLAB::engOpenSingleUse (const char ∗ *startcmd*) `[inline]`

Opens engine for single use.

6.37.3.7 int CMATLAB::engOutputBuffer (Engine ∗ *ep*, char ∗ *buffer*, int *buflen*) `[inline]`

Sets engines output buffer.

6.37.3.8 int CMATLAB::engPutVariable (Engine ∗ *ep*, const string & *var_name*, const mxArray ∗ *ap*) `[inline]`

Puts variable into engine.

6.37.3.9 int CMATLAB::engSetVisible (Engine ∗ *ep*, bool *newVal*) `[inline]`

Sets engine to (in)visible.

6.37.3.10 bool CMATLAB::matClose (MATFile ∗ *pmat*) `[inline]`

Closes mat file using libmat.

6.37.3.11 void CMATLAB::matGet (string *filename*, ArrayXd & *X*, string *Xname*)

gets 1 array from .mat file.

6.37.3.12 mxArray∗ CMATLAB::matGetVariable (MATFile ∗ *pmat*, const string & *name*) `[inline]`

Gets variable from mat file using libmat.

6.37.3.13 MATFile∗ CMATLAB::matOpen (const string & *filename*, const string & *mode*) `[inline]`

Opens mat file using libmat.

6.37.3.14 void CMATLAB::matPut (string *filename*, const ArrayXd & *X*, string *Xname*)

Puts 1 array to .mat file.

6.37.3.15 bool CMATLAB::matPutVariable (MATFile ∗ *pmat*, const string & *name*, const mxArray ∗ *pa*) [inline]

Puts variable in mat file using libmat.

6.37.3.16 mxArray∗ CMATLAB::mxCreateDoubleMatrix (int *N*, int *M*) [inline]

Creats double matrix using libmx.

6.37.3.17 void CMATLAB::mxDestroyArray (mxArray ∗ *pa*) [inline]

Destroys array using libmx.

6.37.3.18 int CMATLAB::mxGetNumberOfElements (mxArray ∗ *pa*) [inline]

Returns number of ements in mxArray using libmx.

6.37.3.19 double∗ CMATLAB::mxGetPr (mxArray ∗ *pa*) [inline]

Sets data in double matrix using libmx.

6.37.3.20 std::string & CMATLAB::Path ( ) [static]

Returns path to the matlab lib.

6.37.3.21 void CMATLAB::SetPath (const std::string & *_path*) [static]

Sets path to the matlab lib.

6.37.4 Member Data Documentation

6.37.4.1 QLibrary CMATLAB::libeng [private]

QLibrary for libeng.

6.37.4.2 QLibrary CMATLAB::libmat [private]

QLibrary for libmat.

6.37.4.3 QLibrary CMATLAB::libmx [private]

QLibrary for libmx.

6.37.4.4 std::string CMATLAB::path = "C:\\Program Files\\MATLAB\\R2010b\\bin\\win64" [static]

Path to the matlab lib.

6.37.4.5 engftype3 CMATLAB::pEngClose [private]

Reference to engClose function from libeng.

6.37.4.6 engftype6 CMATLAB::pEngEvalString [private]

Reference to engEvalString function from libeng.

6.37.4.7 engftype7 CMATLAB::pEngGetVariable [private]

Reference to engGetVariable function from libeng.

6.37.4.8 engftype4 CMATLAB::pEngGetVisible [private]

Reference to engGetVisible function from libeng.

6.37.4.9 engftype2 CMATLAB::pEngOpen [private]

Reference to engOpen function from libeng.

6.37.4.10 engftype1 CMATLAB::pEngOpenSingleUse [private]

Reference to engOpenSingleUse function from libeng.

6.37.4.11 engftype9 CMATLAB::pEngOutputBuffer [private]

Reference to engOutputBuffer function from libeng.

6.37.4.12 engftype8 CMATLAB::pEngPutVariable [private]

Reference to engPutVariable function from libeng.

6.37.4.13 engftype5 CMATLAB::pEngSetVisible [private]

Reference to engSetVisible function from libeng.

6.37.4.14 matftype2 CMATLAB::pMatClose [private]

Reference to matClose function from libmat.

6.37.4.15 matftype4 CMATLAB::pMatGetVariable [private]

Reference to matGetVariable function from libmat.

6.37.4.16 matftype1 CMATLAB::pMatOpen [private]

Reference to matOpen function from libmat.

6.37.4.17 matftype3 CMATLAB::pMatPutVariable [private]

Reference to matPutVariable function from libmat.

6.37.4.18 mxftype1 CMATLAB::pMxCreateDoubleMatrix [private]

Reference to mxCreateDoubleMatrix function from libmx.

6.37.4.19 mxftype2 CMATLAB::pMxDestroyArray [private]

Reference to mxDestroyArray function from libmx.

6.37.4.20 mxftype5 CMATLAB::pMxGetNumberOfElements [private]

Reference to mxSetPr function from libmx.

6.37.4.21 mxftype3 CMATLAB::pMxGetPr [private]

Reference to mxGetPr function from libmx.

6.37.4.22 mxftype4 CMATLAB::pMxSetPr [private]

Reference to mxSetPr function from libmx.

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

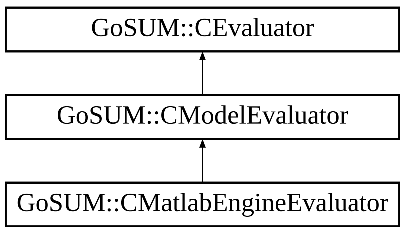
- C:/Development/core/MatlabLibrary.h
- C:/Development/core/MatlabLibrary.cpp

6.38 GoSUM::CMatlabEngineEvaluator Class Reference

Class for the evaluator through Matlab engine derived from CModelEvaluator.

`#include <OriginalModel.h>`

Inheritance diagram for GoSUM::CMatlabEngineEvaluator:



Public Member Functions

- CMatlabEngineEvaluator ()
- CMatlabEngineEvaluator (const CInputParameters ∗_pIP, COutputStates ∗_pOS, int _trdl)
- virtual ∼CMatlabEngineEvaluator ()
- virtual void openEvaluation ()

  Opens, i.e. prepares evaluation process.

- virtual ArrayXd operator() (const ArrayXd &X)

  Returns output state evaluated on a single input parameter n-tuple.
- virtual int evaluateOutputsSize ()

  Evaluates outputs size by running model evaluator.
- virtual void closeEvaluation ()

  Closes evaluation process.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Protected Attributes

- Engine ∗ ep

  Points to the matlab engine.
- CMATLAB matlab

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.38.1 Detailed Description

Class for the evaluator through Matlab engine derived from CModelEvaluator.

6.38.2 Constructor & Destructor Documentation

6.38.2.1 GoSUM::CMatlabEngineEvaluator::CMatlabEngineEvaluator ( ) [inline]

6.38.2.2 GoSUM::CMatlabEngineEvaluator::CMatlabEngineEvaluator (const CInputParameters ∗ *_pIP*, COutputStates ∗ *_pOS*, int *_trdI*) [inline]

6.38.2.3 virtual GoSUM::CMatlabEngineEvaluator::∼CMatlabEngineEvaluator ( ) [inline], [virtual]

6.38.3 Member Function Documentation

6.38.3.1 void GoSUM::CMatlabEngineEvaluator::closeEvaluation ( ) [virtual]

Closes evaluation process.

Implements GoSUM::CModelEvaluator.

6.38.3.2 int GoSUM::CMatlabEngineEvaluator::evaluateOutputsSize ( ) [virtual]

Evaluates outputs size by running model evaluator.

Reimplemented from GoSUM::CModelEvaluator.

6.38.3.3 void GoSUM::CMatlabEngineEvaluator::openEvaluation ( ) `[virtual]`

Opens, i.e. prepares evaluation process.

Implements GoSUM::CModelEvaluator.

6.38.3.4 ArrayXd GoSUM::CMatlabEngineEvaluator::operator() (const ArrayXd & *X*) `[virtual]`

Returns output state evaluated on a single input parameter n-tuple.

Implements GoSUM::CModelEvaluator.

6.38.3.5 template<class Archive > void GoSUM::CMatlabEngineEvaluator::serialize (Archive & *ar*, const unsigned int *version*) `[protected]`

Reimplemented from GoSUM::CModelEvaluator.

6.38.4 Friends And Related Function Documentation

6.38.4.1 friend class boost::serialization::access `[friend]`

Boost serialization.

6.38.5 Member Data Documentation

6.38.5.1 Engine∗ GoSUM::CMatlabEngineEvaluator::ep `[protected]`

Points to the matlab engine.

6.38.5.2 CMATLAB GoSUM::CMatlabEngineEvaluator::matlab `[protected]`

Object for matlab library functions.

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

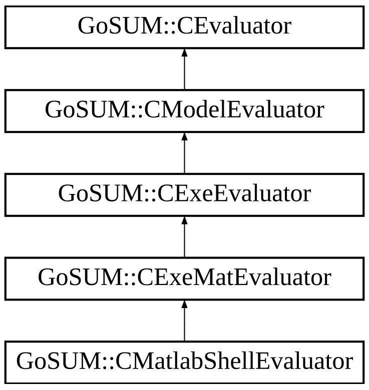
- C:/Development/core/OriginalModel.h
- C:/Development/core/OriginalModel.cpp

6.39 GoSUM::CMatlabShellEvaluator Class Reference

Class for the evaluator through Matlab engine and .mat i/o.

`#include <OriginalModel.h>`

Inheritance diagram for GoSUM::CMatlabShellEvaluator:



Public Member Functions

- CMatlabShellEvaluator ()
- CMatlabShellEvaluator (const CInputParameters ∗_pIP, COutputStates ∗_pOS, int _trdl)
- virtual ∼CMatlabShellEvaluator ()

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- virtual void systemCommand (std::ostringstream &cmd)

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.39.1 Detailed Description

Class for the evaluator through Matlab engine and .mat i/o.

6.39.2 Constructor & Destructor Documentation

6.39.2.1 GoSUM::CMatlabShellEvaluator::CMatlabShellEvaluator ( ) [inline]

6.39.2.2 GoSUM::CMatlabShellEvaluator::CMatlabShellEvaluator (const CInputParameters ∗ *_pIP,* COutputStates ∗ *_pOS,* int *_trdl*) [inline]

6.39.2.3 virtual GoSUM::CMatlabShellEvaluator::∼CMatlabShellEvaluator ( ) [inline], [virtual]

6.39.3 Member Function Documentation

6.39.3.1 template<class Archive > void GoSUM::CMatlabShellEvaluator::serialize (Archive & *ar,* const unsigned int *version*) [protected]

Reimplemented from GoSUM::CExeMatEvaluator.

6.39.3.2 virtual void GoSUM::CMatlabShellEvaluator::systemCommand (std::ostringstream & *cmd*) [inline], [protected], [virtual]

Reimplemented from GoSUM::CExeEvaluator.

6.39.4 Friends And Related Function Documentation

6.39.4.1 friend class boost::serialization::access [friend]

Boost serialization.

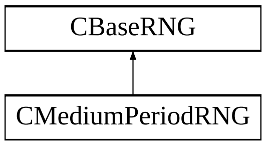
The documentation for this class was generated from the following files:

- C:/Development/core/OriginalModel.h
- C:/Development/core/OriginalModel.cpp

6.40 CMediumPeriodRNG Class Reference

`#include <RandomGenerators.h>`

Inheritance diagram for CMediumPeriodRNG:



Public Member Functions

- CMediumPeriodRNG ()
- CMediumPeriodRNG (unsigned int s)
- virtual ~CMediumPeriodRNG ()
- virtual void setSeed (unsigned int s)

  Sets seed of the RNG.
- virtual unsigned int rndi ()

  Returns randomly generated unsigned int.
- virtual double rnd ()

  Returns randomly generated double between 0 and 1.

Static Private Attributes

- static long idum2 = 123456789

  Paramters of the medium period RNG.
- static long iy2 = 0

  Paramters of the medium period RNG.
- static long iv2 [NTAB]

  Paramters of the medium period RNG.
- static long idum = 0

  Paramters of the medium period RNG.

6.40.1 Constructor & Destructor Documentation

6.40.1.1 CMediumPeriodRNG::CMediumPeriodRNG ( ) [inline]

6.40.1.2 CMediumPeriodRNG::CMediumPeriodRNG (unsigned int *s*) [inline]

6.40.1.3 virtual CMediumPeriodRNG::∼CMediumPeriodRNG ( ) [inline], [virtual]

6.40.2 Member Function Documentation

6.40.2.1 double CMediumPeriodRNG::rnd ( ) [virtual]

Returns randomly generated double between 0 and 1.

Implements CBaseRNG.

6.40.2.2 virtual unsigned int CMediumPeriodRNG::rndi ( ) [inline], [virtual]

Returns randomly generated unsigned int.

Implements CBaseRNG.

6.40.2.3 void CMediumPeriodRNG::setSeed (unsigned int *s*) [virtual]

Sets seed of the RNG.

Implements CBaseRNG.

6.40.3 Member Data Documentation

6.40.3.1 long CMediumPeriodRNG::idum = 0 [static], [private]

Paramters of the medium period RNG.

6.40.3.2 long CMediumPeriodRNG::idum2 = 123456789 [static], [private]

Paramters of the medium period RNG.

6.40.3.3 long CMediumPeriodRNG::iv2 [static], [private]

Paramters of the medium period RNG.

6.40.3.4 long CMediumPeriodRNG::iy2 = 0 [static], [private]

Paramters of the medium period RNG.

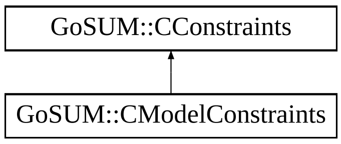
The documentation for this class was generated from the following files:

- C:/Development/core/RandomGenerators.h
- C:/Development/core/RandomGenerators.cpp

6.41 GoSUM::CModelConstraints Class Reference

```
#include <Constraints.h>
```

Inheritance diagram for GoSUM::CModelConstraints:



Public Member Functions

- CModelConstraints ()
- virtual ∼CModelConstraints ()
- virtual void clear ()

  Clears object.
- void set (CInputParameters ∗_pIP)

  Sets input parameters pointer.
- bool isConstrained (int _at) const

  Returns status (cosntrained or not) for particular input parameter.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- virtual void setVariableNames ()

  Sets variable names for the parser.

Protected Attributes

- CInputParameters ∗ pIP

  Points to input parameters.
- std::vector< bool > status

Friends

- class boost::serialization::access

  Boost serialization.

6.41.1 Constructor & Destructor Documentation

6.41.1.1 GoSUM::CModelConstraints::CModelConstraints ( ) `[inline]`

6.41.1.2 virtual GoSUM::CModelConstraints::∼CModelConstraints ( ) `[inline], [virtual]`

6.41.2 Member Function Documentation

6.41.2.1 virtual void GoSUM::CModelConstraints::clear ( ) `[inline], [virtual]`

Clears object.

Reimplemented from GoSUM::CConstraints.

6.41.2.2 bool GoSUM::CModelConstraints::isConstrained (int *_at*) const [inline]

Returns status (cosntrained or not) for particular input parameter.

6.41.2.3 template<class Archive > void GoSUM::CModelConstraints::serialize (Archive & *ar,* const unsigned int *version*) [protected]

Reimplemented from GoSUM::CConstraints.

6.41.2.4 void GoSUM::CModelConstraints::set (CInputParameters ∗ *_pIP*)

Sets input parameters pointer.

6.41.2.5 void GoSUM::CModelConstraints::setVariableNames ( ) [protected], [virtual]

Sets variable names for the parser.

Implements GoSUM::CConstraints.

6.41.3 Friends And Related Function Documentation

6.41.3.1 friend class boost::serialization::access [friend]

Boost serialization.

6.41.4 Member Data Documentation

6.41.4.1 CInputParameters∗ GoSUM::CModelConstraints::pIP [protected]

Points to input parameters.

6.41.4.2 std::vector<bool> GoSUM::CModelConstraints::status [protected]

Status (constrained or not) for each input parameter.

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

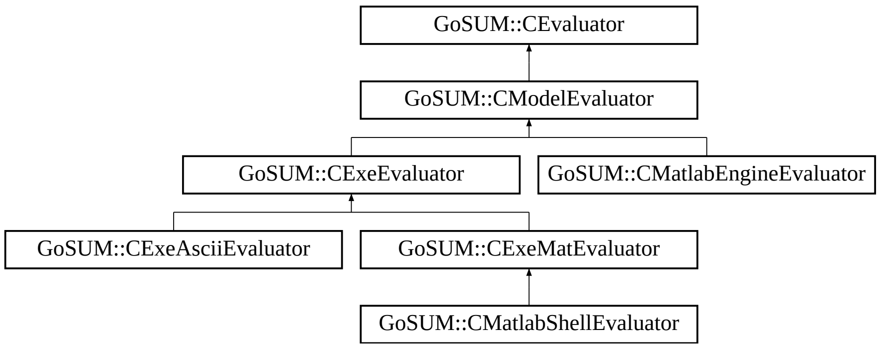
- C:/Development/core/Constraints.h
- C:/Development/core/Constraints.cpp

6.42 GoSUM::CModelEvaluator Class Reference

Class for GoSUM model evaluator.

`#include <OriginalModel.h>`

Inheritance diagram for GoSUM::CModelEvaluator:


GoSUM::CEvaluator
GoSUM::CModelEvaluator
GoSUM::CExeEvaluator
GoSUM::CMatlabEngineEvaluator
GoSUM::CExeAsciiEvaluator
GoSUM::CExeMatEvaluator
GoSUM::CMatlabShellEvaluator

Public Member Functions

- CModelEvaluator ()
- CModelEvaluator (const CInputParameters ∗_pIP, COutputStates ∗_pOS, int _trdl)
- virtual ∼CModelEvaluator ()
- virtual void openEvaluation ()=0

  Opens, i.e. prepares evaluation process.
- virtual ArrayXd operator() (const ArrayXd &X)=0

  Returns output state evaluated on a single input parameter n-tuple.
- virtual void operator() ()

  Thread calls this operator which then evalutes output states from every trdl-th input parameter n-tuple.
- virtual int evaluateOutputsSize ()

  Evaluates outputs size by running model evaluator.
- virtual void closeEvaluation ()=0

  Closes evaluation process.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Protected Attributes

- const CInputParameters ∗ pIP

  Pointer to GoSUM input parameters.
- COutputStates ∗ pOS

  Pointer to GoSUM output states.
- int trdl
- int l

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.42.1 Detailed Description

Class for GoSUM model evaluator.

6.42.2 Constructor & Destructor Documentation

6.42.2.1 GoSUM::CModelEvaluator::CModelEvaluator ( ) [inline]

6.42.2.2 GoSUM::CModelEvaluator::CModelEvaluator (const CInputParameters ∗ *_pIP*, COutputStates ∗ *_pOS*, int *_trdI*) [inline]

6.42.2.3 virtual GoSUM::CModelEvaluator::∼CModelEvaluator ( ) [inline], [virtual]

6.42.3 Member Function Documentation

6.42.3.1 virtual void GoSUM::CModelEvaluator::closeEvaluation ( ) [pure virtual]

Closes evaluation process.

Implemented in GoSUM::CMatlabEngineEvaluator, and GoSUM::CExeEvaluator.

6.42.3.2 virtual int GoSUM::CModelEvaluator::evaluateOutputsSize ( ) [inline], [virtual]

Evaluates outputs size by running model evaluator.

Reimplemented in GoSUM::CMatlabEngineEvaluator, and GoSUM::CExeEvaluator.

6.42.3.3 virtual void GoSUM::CModelEvaluator::openEvaluation ( ) [pure virtual]

Opens, i.e. prepares evaluation process.

Implemented in GoSUM::CMatlabEngineEvaluator, and GoSUM::CExeEvaluator.

6.42.3.4 virtual ArrayXd GoSUM::CModelEvaluator::operator() (const ArrayXd & *X*) [pure virtual]

Returns output state evaluated on a single input parameter n-tuple.

Implemented in GoSUM::CMatlabEngineEvaluator, and GoSUM::CExeEvaluator.

6.42.3.5 void GoSUM::CModelEvaluator::operator() ( ) [virtual]

Thread calls this operator which then evalutes output states from every trdI-th input parameter n-tuple.

6.42.3.6 template<class Archive > void GoSUM::CModelEvaluator::serialize (Archive & *ar*, const unsigned int *version*) [protected]

Reimplemented from GoSUM::CEvaluator.

Reimplemented in GoSUM::CMatlabEngineEvaluator, GoSUM::CMatlabShellEvaluator, GoSUM::CExeMatEvaluator, GoSUM::CExeAsciiEvaluator, and GoSUM::CExeEvaluator.

6.42.4 Friends And Related Function Documentation

6.42.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.42.5 Member Data Documentation

6.42.5.1 int GoSUM::CModelEvaluator::I [protected]

Total number of threads and id of the particular thread this class runs in.

6.42.5.2 const CInputParameters∗ GoSUM::CModelEvaluator::pIP [protected]

Pointer to GoSUM input parameters.

6.42.5.3 COutputStates∗ GoSUM::CModelEvaluator::pOS [protected]

Pointer to GoSUM output states.

6.42.5.4 int GoSUM::CModelEvaluator::trdI [protected]

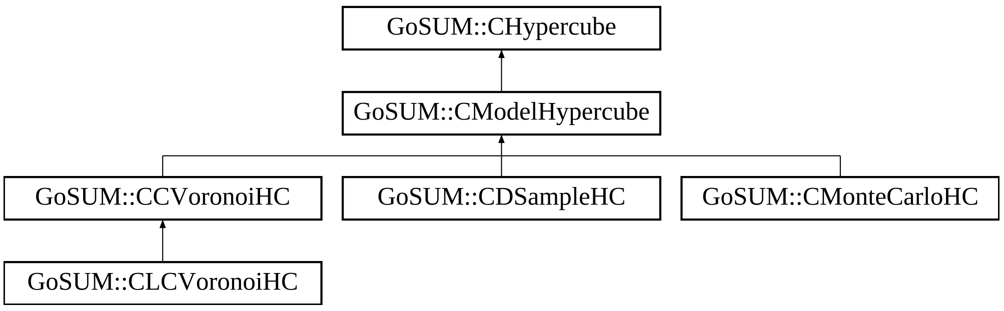
The documentation for this class was generated from the following files:

- C:/Development/core/OriginalModel.h
- C:/Development/core/OriginalModel.cpp

6.43 GoSUM::CModelHypercube Class Reference

```
#include <Hypercube.h>
```

Inheritance diagram for GoSUM::CModelHypercube:



Public Member Functions

- CModelHypercube (CInputParameters ∗_pIP)
- virtual ∼CModelHypercube ()
- virtual void generate (int _rssize, int _dim, std::vector< ArrayXd > &_samples)

  Generates _samples: _rssize model points (satisifing constraints) of dimension _dim.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- ArrayXd & generateHCPoint (ArrayXd &x)
- void generateHCPoints (int N, int dim, std::vector< ArrayXd > &y)

  Generates N hypercube points.

- void generateModelPoints (int N, int dim, std::vector< ArrayXd > &y)

  Generates N model points.
- void checkHCPoints (std::vector< ArrayXd > &y)

  Checks if hypercube points when mapped to model points satisfy constraints.
- void hcPoints2ModelPoints (std::vector< ArrayXd > &y)

  Maps hypercube points to model points.
- virtual void doGenerate (int _rssize, int _dim, std::vector< ArrayXd > &_samples)=0

  Core of the generation.
- CModelHypercube ()

Protected Attributes

- CInputParameters ∗ pIP

  Holds pointer to input parameters.
- CModelConstraints ∗ pIC

  Holds pointer to input parameter constraints.
- int maxtries

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.43.1 Constructor & Destructor Documentation

6.43.1.1 GoSUM::CModelHypercube::CModelHypercube ( ) [inline], [protected]

6.43.1.2 GoSUM::CModelHypercube::CModelHypercube (CInputParameters ∗ *_pIP*) [inline]

6.43.1.3 virtual GoSUM::CModelHypercube::∼CModelHypercube ( ) [inline], [virtual]

6.43.2 Member Function Documentation

6.43.2.1 void GoSUM::CModelHypercube::checkHCPoints (std::vector< ArrayXd > & *y*) [protected]

Checks if hypercube points when mapped to model points satisfy constraints.

6.43.2.2 virtual void GoSUM::CModelHypercube::doGenerate (int *_rssize,* int *_dim,* std::vector< ArrayXd > & *_samples*) [protected], [pure virtual]

Core of the generation.

Implemented in GoSUM::CLCVoronoiHC, GoSUM::CCVoronoiHC, GoSUM::CMonteCarloHC, and GoSUM::CD-SampleHC.

6.43.2.3 void GoSUM::CModelHypercube::generate (int *_rssize,* int *_dim,* std::vector< ArrayXd > & *_samples*) [virtual]

Generates _samples: _rssize model points (satisifing constraints) of dimension _dim.

6.43.2.4 ArrayXd& GoSUM::CModelHypercube::generateHCPoint (ArrayXd & *x*) [inline], [protected]

Parameters

x	Generates single hypercube point.

6.43.2.5 void GoSUM::CModelHypercube::generateHCPoints (int *N*, int *dim*, std::vector< ArrayXd > & *y*) [protected]

Generates N hypercube points.

6.43.2.6 void GoSUM::CModelHypercube::generateModelPoints (int *N*, int *dim*, std::vector< ArrayXd > & *y*) [protected]

Generates N model points.

6.43.2.7 void GoSUM::CModelHypercube::hcPoints2ModelPoints (std::vector< ArrayXd > & *y*) [protected]

Maps hypercube points to model points.

6.43.2.8 template<class Archive > void GoSUM::CModelHypercube::serialize (Archive & *ar*, const unsigned int *version*) [protected]

Reimplemented from GoSUM::CHypercube.

Reimplemented in GoSUM::CLCVoronoiHC, GoSUM::CCVoronoiHC, and GoSUM::CMonteCarloHC.

6.43.3 Friends And Related Function Documentation

6.43.3.1 friend class boost::serialization::access [friend]

Boost serialization.

6.43.4 Member Data Documentation

6.43.4.1 int GoSUM::CModelHypercube::maxtries [protected]

Holds maximal number of tries to satisfy model constraints.

6.43.4.2 CModelConstraints* GoSUM::CModelHypercube::pIC [protected]

Holds pointer to input parameter constraints.

6.43.4.3 CInputParameters* GoSUM::CModelHypercube::pIP [protected]

Holds pointer to input parameters.

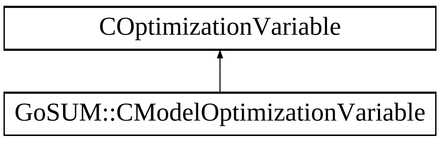
The documentation for this class was generated from the following files:

- C:/Development/core/Hypercube.h
- C:/Development/core/Hypercube.cpp

6.44 GoSUM::CModelOptimizationVariable Class Reference

```
#include <ParserOptimizationProblem.h>
```

Inheritance diagram for GoSUM::CModelOptimizationVariable:



Public Member Functions

- CModelOptimizationVariable (CModelVariable ∗_pip)
- CModelOptimizationVariable (CModelOptimizationVariable &_O)
- virtual ∼CModelOptimizationVariable ()
- CModelVariable ∗ inputParameter () const

  Returns pointer to the input parameter to which model optimization variable is connected.
- void reset ()

  Resets lower bound, upper bound and inital value.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- CModelOptimizationVariable ()

Protected Attributes

- CModelVariable ∗ pip

Friends

- class boost::serialization::access

  Boost serialization.

6.44.1 Constructor & Destructor Documentation

6.44.1.1 GoSUM::CModelOptimizationVariable::CModelOptimizationVariable ( ) `[inline], [protected]`

6.44.1.2 GoSUM::CModelOptimizationVariable::CModelOptimizationVariable (**CModelVariable** ∗ *_pip*) `[inline]`

6.44.1.3 GoSUM::CModelOptimizationVariable::CModelOptimizationVariable (**CModelOptimizationVariable** & *_O*) `[inline]`

6.44.1.4 virtual GoSUM::CModelOptimizationVariable::∼CModelOptimizationVariable ( ) `[inline], [virtual]`

6.44.2 Member Function Documentation

6.44.2.1 **CModelVariable**∗ GoSUM::CModelOptimizationVariable::inputParameter ( ) const `[inline]`

Returns pointer to the input parameter to which model optimization variable is connected.

6.44.2.2 void GoSUM::CModelOptimizationVariable::reset ( ) [inline]

Resets lower bound, upper bound and inital value.

6.44.2.3 template<class Archive > void GoSUM::CModelOptimizationVariable::serialize (Archive & *ar*, const unsigned int *version*) [protected]

Reimplemented from COptimizationVariable.

6.44.3 Friends And Related Function Documentation

6.44.3.1 friend class boost::serialization::access [friend]

Boost serialization.

6.44.4 Member Data Documentation

6.44.4.1 CModelVariable* GoSUM::CModelOptimizationVariable::pip [protected]

Holds pointer to the input parameter to which model optimization variable is connected.

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

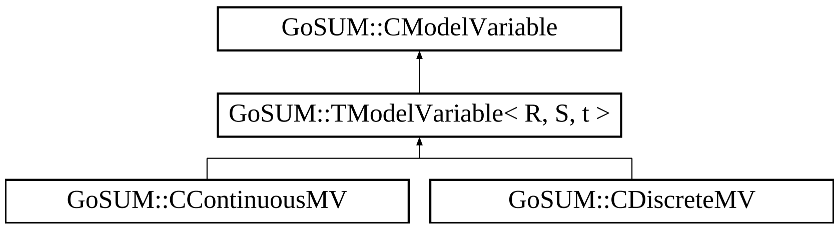
- C:/Development/core/ParserOptimizationProblem.h
- C:/Development/core/ParserOptimizationProblem.cpp

6.45 GoSUM::CModelVariable Class Reference

Class for any variable in the GoSUM model (input or output).

`#include <ModelVariable.h>`

Inheritance diagram for GoSUM::CModelVariable:



Public Member Functions

- CModelVariable ()
- virtual ~CModelVariable ()
- CModelVariable * clone (std::string _uname)

    Clones itself to a new model variable with different name.
- void setName (const std::string &_uname)

    Set name of the model variable.
- std::string name () const

    Returns name of the model variable.

- virtual void clearSample ()=0

  Clears variable's sample.
- virtual int expandedSize () const =0
- virtual void setSampleSize (int _n)=0

  Returns number of variables after expansion for analytical model.
- virtual int sampleSize () const =0

  Returns sample size.
- virtual void setSampleValue (double _val, int _at)=0

  Sets particular sample value.
- virtual double sampleValue (int _at) const =0

  Returns particular sample value.
- virtual void readSampleValue (std::ifstream &_ifs, int _at)=0

  Reads particular sample value from input file stream.
- virtual void writeSampleValue (std::ofstream &_ofs, int _at) const =0

  Writes particular sample value to output file stream.
- virtual void generateSampleValue (double _ranval, int _at)=0

  Generates particular sample value using actual random variable model.
- virtual double generateSampleValue (double _p)=0

  Generates sample value using actual random variable model.
- virtual void computeStatistics (int _n)=0

  Computes statistics from sample (histogram, empirical mean and standard deviation etc.).
- virtual double minValue () const =0

  Returns minimal variable value.
- virtual double maxValue () const =0

  Returns maximal variable value.
- virtual double expectedValue () const =0

  Returns expected variable value.
- virtual void setEmpiricalDistribution ()

  Computes distribution of the actual random variable from empirical sample data.
- virtual void setTheoreticalDistribution ()

  Tests goodness-of-fit for theoretical random variables and replaces with the best that satisfies Kolomogorov-Smirnov.
- virtual void setDistribution ()

  Computes distribution of the actual random variable from available data.
- virtual
  CRandomVariable::distributiontype distributionType () const =0

  Returns type of the random variable distribution.
- virtual std::string distributionName () const =0

  Returns name of the random variable distribution.
- virtual bool isContinuous () const =0

  Returns true if model variable is continuous, false otherwise.
- virtual bool isDiscrete () const =0

  Returns true if model variable is discrete, false otherwise.
- virtual bool isDistributionDefined () const =0

  Returns true if distribution is defined, false otherwise.
- CContinuousMV $*$ cast2ContinuousMV ()

  Safe cast of model variable to CContinuousMV type.
- CDiscreteMV $*$ cast2DiscreteMV ()

  Safe cast of model variable to CDiscreteMV type.
- virtual CRandomVariable $*$ randomVariable () const =0

  Returns random variable.
- virtual CSample $*$ sample () const =0

  Returns sample.
- ArrayXd castExportSample ()

  Exports model variables sample and casts it to array of doubles.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Protected Attributes

- std::string uname

Friends

- class boost::serialization::access

  Boost serialization.

6.45.1 Detailed Description

Class for any variable in the GoSUM model (input or output).

6.45.2 Constructor & Destructor Documentation

6.45.2.1 GoSUM::CModelVariable::CModelVariable ( ) `[inline]`

6.45.2.2 virtual GoSUM::CModelVariable::∼CModelVariable ( ) `[inline], [virtual]`

6.45.3 Member Function Documentation

6.45.3.1 GoSUM::CContinuousMV $*$ GoSUM::CModelVariable::cast2ContinuousMV ( )

Safe cast of model variable to CContinuousMV type.

6.45.3.2 GoSUM::CDiscreteMV $*$ GoSUM::CModelVariable::cast2DiscreteMV ( )

Safe cast of model variable to CDiscreteMV type.

6.45.3.3 ArrayXd GoSUM::CModelVariable::castExportSample ( )

Exports model variables sample and casts it to array of doubles.

6.45.3.4 virtual void GoSUM::CModelVariable::clearSample ( ) `[pure virtual]`

Clears variable's sample.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.5 GoSUM::CModelVariable $*$ GoSUM::CModelVariable::clone (std::string *_uname*)

Clones itself to a new model variable with different name.

6.45.3.6 virtual void GoSUM::CModelVariable::computeStatistics (int *_n*) [pure virtual]

Computes statistics from sample (histogram, empirical mean and standard deviation etc.).

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.7 virtual std::string GoSUM::CModelVariable::distributionName ( ) const [pure virtual]

Returns name of the random variable distribution.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.8 virtual CRandomVariable::distributiontype GoSUM::CModelVariable::distributionType ( ) const [pure virtual]

Returns type of the random variable distribution.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.9 virtual int GoSUM::CModelVariable::expandedSize ( ) const [pure virtual]

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.10 virtual double GoSUM::CModelVariable::expectedValue ( ) const [pure virtual]

Returns expected variable value.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.11 virtual void GoSUM::CModelVariable::generateSampleValue (double *_ranval,* int *_at*) [pure virtual]

Generates particular sample value using actual random variable model.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.12 virtual double GoSUM::CModelVariable::generateSampleValue (double *_p*) [pure virtual]

Generates sample value using actual random variable model.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.13 virtual bool GoSUM::CModelVariable::isContinuous ( ) const [pure virtual]

Returns true if model variable is continuous, false otherwise.

Implemented in GoSUM::CContinuousMV, and GoSUM::CDiscreteMV.

6.45.3.14 virtual bool GoSUM::CModelVariable::isDiscrete ( ) const [pure virtual]

Returns true if model variable is discrete, false otherwise.

Implemented in GoSUM::CContinuousMV, and GoSUM::CDiscreteMV.

6.45.3.15 virtual bool GoSUM::CModelVariable::isDistributionDefined ( ) const [pure virtual]

Returns true if distribution is defined, false otherwise.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.16 virtual double GoSUM::CModelVariable::maxValue ( ) const [pure virtual]

Returns maximal variable value.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.17 virtual double GoSUM::CModelVariable::minValue ( ) const [pure virtual]

Returns minimal variable value.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.18 std::string GoSUM::CModelVariable::name ( ) const [inline]

Returns name of the model variable.

6.45.3.19 virtual CRandomVariable∗ GoSUM::CModelVariable::randomVariable ( ) const [pure virtual]

Returns random variable.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.20 virtual void GoSUM::CModelVariable::readSampleValue (std::ifstream & *_ifs,* int *_at*) [pure virtual]

Reads particular sample value from input file stream.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.21 virtual CSample∗ GoSUM::CModelVariable::sample ( ) const [pure virtual]

Returns sample.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.22 virtual int GoSUM::CModelVariable::sampleSize ( ) const [pure virtual]

Returns sample size.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.23 virtual double GoSUM::CModelVariable::sampleValue (int *_at*) const [pure virtual]

Returns particular sample value.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.24 template<class Archive > void GoSUM::CModelVariable::serialize (Archive & *ar,* const unsigned int *version*) [inline], [protected]

Reimplemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.25 virtual void GoSUM::CModelVariable::setDistribution ( ) [inline], [virtual]

Computes distribution of the actual random variable from available data.

6.45.3.26 virtual void GoSUM::CModelVariable::setEmpiricalDistribution ( ) [inline], [virtual]

Computes distribution of the actual random variable from empirical sample data.

Reimplemented in GoSUM::CContinuousMV, GoSUM::CDiscreteMV, and GoSUM::TModelVariable< R, S, t >.

6.45.3.27 void GoSUM::CModelVariable::setName (const std::string & *_uname*) [inline]

Set name of the model variable.

6.45.3.28 virtual void GoSUM::CModelVariable::setSampleSize (int *_n*) [pure virtual]

Returns number of variables after expansion for analytical model.

Sets sample size.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.29 virtual void GoSUM::CModelVariable::setSampleValue (double *_val,* int *_at*) [pure virtual]

Sets particular sample value.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.3.30 virtual void GoSUM::CModelVariable::setTheoreticalDistribution ( ) [inline], [virtual]

Tests goodness-of-fit for theoretical random variables and replaces with the best that satisfies Kolomogorov--Smirnov.

Reimplemented in GoSUM::CContinuousMV, GoSUM::CDiscreteMV, and GoSUM::TModelVariable< R, S, t >.

6.45.3.31 virtual void GoSUM::CModelVariable::writeSampleValue (std::ofstream & *_ofs,* int *_at*) const [pure virtual]

Writes particular sample value to output file stream.

Implemented in GoSUM::TModelVariable< R, S, t >.

6.45.4 Friends And Related Function Documentation

6.45.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.45.5 Member Data Documentation

6.45.5.1 std::string GoSUM::CModelVariable::uname [protected]

Unique name of the model variable.

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

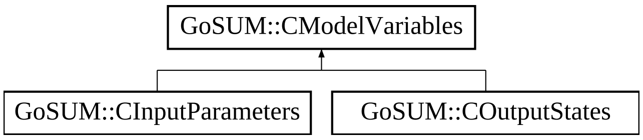
- C:/Development/core/ModelVariable.h
- C:/Development/core/ModelVariable.cpp

6.46 GoSUM::CModelVariables Class Reference

Class for the vector of model variables (inputs & outputs).

`#include <Model.h>`

Inheritance diagram for GoSUM::CModelVariables:



Public Member Functions

- CModelVariables ()
- virtual ∼CModelVariables ()
- std::string baseName () const

    Returns base name.
- void setBaseName (std::string _basename)

    Sets base name.
- std::string nextName () const

    Returns next variable name.
- bool empty () const

    Returns true if object contains no model variables, false otherwise.
- bool emptySamples () const

    Returns true if object contains no samples, false otherwise.
- void clear ()
- void clearSamples ()

    Clears data.
- const CModelVariable & operator() (int _at) const

    Clears samples.
- CModelVariable & operator() (int _at)

    Returns paticular model variable.
- int find (const std::string &_name) const

    < Finds model variable by name, returns it's index.
- int size () const

    Returns the size of model variables.
- int expandedSize () const

    Returns expanded size of model variables (due to categorical).
- int sampleSize () const

    Returns sample size.
- CModelVariable ∗ add (CModelVariable ∗_pMV)

    Adds, i.e. pushes back model variable.
- CModelVariable ∗ insert (CModelVariable ∗_pMV, int _before)
- void erase (int _at)
- CModelVariable ∗ replace (int _at, CModelVariable ∗_pMV)
- void rename (int _at, const std::string &_name)

- std::vector< ArrayXd > samples ()

  Returns all samples.
- void setSamples (const std::vector< ArrayXd > &_samples)

  Sets samples of all model variables to values in _samples.
- void computeStatistics (int _n)

  Computes statistics of all model variables.
- void computeStatistics (const std::vector< int > &_selected, int _n)
- void setDistributions (const std::vector< int > &_selected)

  For selected model variables detects distribution from empirical sample data.
- void setDistributions ()

  For all model variables detects distribution from empirical sample data.
- void setNTuple (const ArrayXd &X, int _at)

  Sets _at sample values of all model variables.
- ArrayXd nTuple (int _at) const

  Returns n-tuple containing _at sample values of all model variables.
- ArrayXd expandedNTuple (int _at) const

  Returns expanded n-tuple containing _at sample values of all model variables.
- ArrayXd expandNTuple (const ArrayXd &X) const

  Expands given n-tuple.
- void setNormalization ()
- double normalize (double Vi, int i) const

  (Re)sets normalization of model variables using empirical data in samples.
- ArrayXd normalize (const ArrayXd &V) const

  Normalizes values of all (expanded) model variables.
- double denormalize (double Vi, int i) const

  Denoramlizes value of the ith (expanded) model variable.
- ArrayXd denormalize (const ArrayXd &V) const

  Denormalizes values of all (expanded) model variables.
- double dNormalize (int i) const

  Returns derivative of the normalization function for ith (expanded) model variable.
- ArrayXd dNormalize () const

  Returns derivatives of the normalization function for (expanded) model variables.
- double dDenormalize (int i) const

  Returns derivative of the denormalization function for ith (expanded) model variable.
- ArrayXd dDenormalize () const

  Returns derivatives of the denormalization function for (expanded) model variables.
- ArrayXd hcPoint2ModelPoint (const ArrayXd &x)

  Maps hypercube point to model point.
- void eraseSelectedSamples (const std::vector< int > &sel)

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Static Protected Member Functions

- static bool isModelVariableName (const CModelVariable &_aMV)

  Used in member function Find.

Protected Attributes

- std::string basename

  Holds basename used for generating model variable unique names.
- boost::ptr_vector< CModelVariable > mvs

  Holds pointers to model variables.
- ArrayXd trn
- ArrayXd scl

Static Protected Attributes

- static std::string nameToFind = ""

  Used in member function Find.

Friends

- class boost::serialization::access

  Boost serialization.

6.46.1 Detailed Description

Class for the vector of model variables (inputs & outputs).

6.46.2 Constructor & Destructor Documentation

6.46.2.1 GoSUM::CModelVariables::CModelVariables ( ) [inline]

6.46.2.2 virtual GoSUM::CModelVariables::~CModelVariables ( ) [inline], [virtual]

6.46.3 Member Function Documentation

6.46.3.1 CModelVariable* GoSUM::CModelVariables::add (CModelVariable * _pMV) [inline]

Adds, i.e. pushes back model variable.

6.46.3.2 std::string GoSUM::CModelVariables::baseName ( ) const [inline]

Returns base name.

6.46.3.3 void GoSUM::CModelVariables::clear ( ) [inline]

6.46.3.4 void GoSUM::CModelVariables::clearSamples ( ) [inline]

Clears data.

6.46.3.5 void GoSUM::CModelVariables::computeStatistics (int _n) [inline]

Computes statistics of all model variables.

6.46.3.6 void GoSUM::CModelVariables::computeStatistics (const std::vector< int > & *_selected,* int *_n*) [inline]

Parameters

_n	Computes statistics of selected model variables.

6.46.3.7 double GoSUM::CModelVariables::dDenormalize (int *i*) const [inline]

Returns derivative of the denormalization function for ith (expanded) model variable.

6.46.3.8 ArrayXd GoSUM::CModelVariables::dDenormalize ( ) const [inline]

Returns derivatives of the denormalization function for (expanded) model variables.

6.46.3.9 double GoSUM::CModelVariables::denormalize (double *Vi,* int *i*) const [inline]

Denoramlizes value of the ith (expanded) model variable.

6.46.3.10 ArrayXd GoSUM::CModelVariables::denormalize (const ArrayXd & *V*) const [inline]

Denormalizes values of all (expanded) model variables.

6.46.3.11 double GoSUM::CModelVariables::dNormalize (int *i*) const [inline]

Returns derivative of the normalization function for ith (expanded) model variable.

6.46.3.12 ArrayXd GoSUM::CModelVariables::dNormalize ( ) const [inline]

Returns derivatives of the normalization function for (expanded) model variables.

6.46.3.13 bool GoSUM::CModelVariables::empty ( ) const [inline]

Returns true if object contains no model variables, false otherwise.

6.46.3.14 bool GoSUM::CModelVariables::emptySamples ( ) const [inline]

Returns true if object contains no samples, false otherwise.

6.46.3.15 void GoSUM::CModelVariables::erase (int *_at*) [inline]

Parameters

_at	Erases particular model variable.

6.46.3.16 void GoSUM::CModelVariables::eraseSelectedSamples (const std::vector< int > & *sel*) [inline]

Parameters

sel	Erases selected sample values.

6.46.3.17 ArrayXd GoSUM::CModelVariables::expandedNTuple (int *_at*) const

Returns expanded n-tuple containing _at sample values of all model variables.

6.46.3.18 int GoSUM::CModelVariables::expandedSize ( ) const

Returns expanded size of model variables (due to categorical).

6.46.3.19 ArrayXd GoSUM::CModelVariables::expandNTuple (const ArrayXd & *X*) const

Expands given n-tuple.

6.46.3.20 int GoSUM::CModelVariables::find (const std::string & *_name*) const [inline]

< Finds model variable by name, returns it's index.

6.46.3.21 ArrayXd GoSUM::CModelVariables::hcPoint2ModelPoint (const ArrayXd & *x*)

Maps hypercube point to model point.

6.46.3.22 CModelVariable* GoSUM::CModelVariables::insert (CModelVariable * *_pMV,* int *_before*) [inline]

Parameters

_before	Inserts model variable in position _before.

6.46.3.23 static bool GoSUM::CModelVariables::isModelVariableName (const CModelVariable & *_aMV*) [inline], [static], [protected]

Used in member function Find.

6.46.3.24 std::string GoSUM::CModelVariables::nextName ( ) const

Returns next variable name.

6.46.3.25 double GoSUM::CModelVariables::normalize (double *Vi,* int *i*) const [inline]

(Re)sets normalization of model variables using empirical data in samples.

Normalizes value of the ith (expanded) model variable.

6.46.3.26 ArrayXd GoSUM::CModelVariables::normalize (const ArrayXd & *V*) const [inline]

Normalizes values of all (expanded) model variables.

6.46.3.27 ArrayXd GoSUM::CModelVariables::nTuple (int *_at*) const

Returns n-tuple containing _at sample values of all model variables.

6.46.3.28 const CModelVariable& GoSUM::CModelVariables::operator() (int *_at*) const [inline]

Clears samples.

Returns paticular model variable.

6.46.3.29 CModelVariable& GoSUM::CModelVariables::operator() (int *_at*) [inline]

Returns paticular model variable.

6.46.3.30 void GoSUM::CModelVariables::rename (int *_at,* const std::string & *_name*) [inline]

Parameters

_name	Renames particular model variable.

6.46.3.31 CModelVariable* GoSUM::CModelVariables::replace (int *_at,* CModelVariable * *_pMV*) [inline]

Parameters

_pMV	Replaces model variable in position _at with model variable _pMV2. The replaced variable is destroyed.

6.46.3.32 std::vector< ArrayXd > GoSUM::CModelVariables::samples ( )

Returns all samples.

6.46.3.33 int GoSUM::CModelVariables::sampleSize ( ) const [inline]

Returns sample size.

6.46.3.34 template<class Archive > void GoSUM::CModelVariables::serialize (Archive & *ar,* const unsigned int *version*) [protected]

6.46.3.35 void GoSUM::CModelVariables::setBaseName (std::string *_basename*) [inline]

Sets base name.

6.46.3.36 void GoSUM::CModelVariables::setDistributions (const std::vector< int > & *_selected*)

For selected model variables detects distribution from empirical sample data.

6.46.3.37 void GoSUM::CModelVariables::setDistributions ( )

For all model variables detects distribution from empirical sample data.

6.46.3.38 void GoSUM::CModelVariables::setNormalization ( )

6.46.3.39 void GoSUM::CModelVariables::setNTuple (const ArrayXd & *X,* int *_at*)

Sets _at sample values of all model variables.

6.46.3.40 void GoSUM::CModelVariables::setSamples (const std::vector< ArrayXd > & *_samples*)

Sets samples of all model variables to values in _samples.

6.46.3.41 int GoSUM::CModelVariables::size ( ) const `[inline]`

Returns the size of model variables.

6.46.4 Friends And Related Function Documentation

6.46.4.1 friend class boost::serialization::access `[friend]`

Boost serialization.

6.46.5 Member Data Documentation

6.46.5.1 std::string GoSUM::CModelVariables::basename `[protected]`

Holds basename used for generating model variable unique names.

6.46.5.2 boost::ptr_vector<**CModelVariable**> GoSUM::CModelVariables::mvs `[protected]`

Holds pointers to model variables.

6.46.5.3 std::string GoSUM::CModelVariables::nameToFind = ”” `[static]`, `[protected]`

Used in member function Find.

6.46.5.4 ArrayXd GoSUM::CModelVariables::scl `[protected]`

Holds translation and scaling values for normalization of model variables.

6.46.5.5 ArrayXd GoSUM::CModelVariables::trn `[protected]`

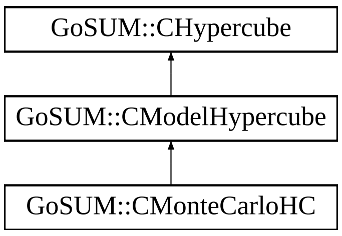
The documentation for this class was generated from the following files:

- C:/Development/core/Model.h
- C:/Development/core/Model.cpp

6.47 GoSUM::CMonteCarloHC Class Reference

`#include <Hypercube.h>`

Inheritance diagram for GoSUM::CMonteCarloHC:



Public Member Functions

- CMonteCarloHC (CInputParameters ∗_pIP)
- virtual ∼CMonteCarloHC ()

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- virtual void doGenerate (int _rssize, int _dim, std::vector< ArrayXd > &_samples)

  Core of the generation.
- CMonteCarloHC ()

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.47.1 Constructor & Destructor Documentation

6.47.1.1 GoSUM::CMonteCarloHC::CMonteCarloHC ( ) `[inline]`, `[protected]`

6.47.1.2 GoSUM::CMonteCarloHC::CMonteCarloHC (CInputParameters ∗ *_pIP*) `[inline]`

6.47.1.3 virtual GoSUM::CMonteCarloHC::∼CMonteCarloHC ( ) `[inline]`, `[virtual]`

6.47.2 Member Function Documentation

6.47.2.1 void GoSUM::CMonteCarloHC::doGenerate (int *_rssize*, int *_dim*, std::vector< ArrayXd > & *_samples*) `[protected]`, `[virtual]`

Core of the generation.

Implements GoSUM::CModelHypercube.

6.47.2.2 template<class Archive > void GoSUM::CMonteCarloHC::serialize (Archive & *ar*, const unsigned int *version*) `[protected]`

Reimplemented from GoSUM::CModelHypercube.

6.47.3 Friends And Related Function Documentation

6.47.3.1 friend class boost::serialization::access `[friend]`

Boost serialization.

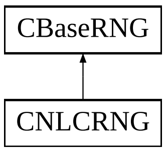
The documentation for this class was generated from the following files:

- C:/Development/core/Hypercube.h
- C:/Development/core/Hypercube.cpp

6.48 CNLCRNG Class Reference

`#include <RandomGenerators.h>`

Inheritance diagram for CNLCRNG:



Public Member Functions

- CNLCRNG ()
- CNLCRNG (unsigned int s)
- virtual ∼CNLCRNG ()
- virtual void setSeed (unsigned int s)

  Sets seed of the RNG.
- virtual unsigned int rndi ()

  Returns randomly generated unsigned int.
- virtual double rnd ()

  Returns randomly generated double between 0 and 1.

Static Private Attributes

- static int inext
- static int inextp

  Paramters of the nlc RNG.
- static long ma [56]

  Paramters of the nlc RNG.

6.48.1 Constructor & Destructor Documentation

6.48.1.1 CNLCRNG::CNLCRNG ( ) `[inline]`

6.48.1.2 CNLCRNG::CNLCRNG (unsigned int *s*) `[inline]`

6.48.1.3 virtual CNLCRNG::∼CNLCRNG ( ) `[inline]`, `[virtual]`

6.48.2 Member Function Documentation

6.48.2.1 double CNLCRNG::rnd ( ) `[virtual]`

Returns randomly generated double between 0 and 1.

Implements CBaseRNG.

6.48.2.2 virtual unsigned int CNLCRNG::rndi ( ) `[inline]`, `[virtual]`

Returns randomly generated unsigned int.

Implements CBaseRNG.

6.48.2.3 void CNLCRNG::setSeed (unsigned int *s*) `[virtual]`

Sets seed of the RNG.

Implements CBaseRNG.

6.48.3 Member Data Documentation

6.48.3.1 int CNLCRNG::inext `[static]`, `[private]`

6.48.3.2 int CNLCRNG::inextp `[static]`, `[private]`

Paramters of the nlc RNG.

6.48.3.3 long CNLCRNG::ma `[static]`, `[private]`

Paramters of the nlc RNG.

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

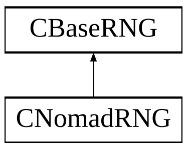
- C:/Development/core/RandomGenerators.h
- C:/Development/core/RandomGenerators.cpp

6.49 CNomadRNG Class Reference

Class for NOMAD RNG with period = 2^96-1.

`#include <RandomGenerators.h>`

Inheritance diagram for CNomadRNG:



Public Member Functions

- CNomadRNG ()
- CNomadRNG (unsigned int s)
- virtual ∼CNomadRNG ()

- virtual void setSeed (unsigned int s)

  Sets seed of the RNG.
- virtual unsigned int rndi ()

  Returns randomly generated unsigned int.
- virtual double rnd ()

  Returns randomly generated double between 0 and 1.

Static Private Attributes

- static unsigned int x = 123456789
- static unsigned int y = 362436069
- static unsigned int z = 521288629

6.49.1 Detailed Description

Class for NOMAD RNG with period = 2^96-1.

6.49.2 Constructor & Destructor Documentation

6.49.2.1 CNomadRNG::CNomadRNG ( ) `[inline]`

6.49.2.2 CNomadRNG::CNomadRNG (unsigned int *s*) `[inline]`

6.49.2.3 virtual CNomadRNG::∼CNomadRNG ( ) `[inline], [virtual]`

6.49.3 Member Function Documentation

6.49.3.1 virtual double CNomadRNG::rnd ( ) `[inline], [virtual]`

Returns randomly generated double between 0 and 1.

Implements CBaseRNG.

6.49.3.2 unsigned int CNomadRNG::rndi ( ) `[virtual]`

Returns randomly generated unsigned int.

Implements CBaseRNG.

6.49.3.3 virtual void CNomadRNG::setSeed (unsigned int *s*) `[inline], [virtual]`

Sets seed of the RNG.

Implements CBaseRNG.

6.49.4 Member Data Documentation

6.49.4.1 unsigned int CNomadRNG::x = 123456789 `[static], [private]`

6.49.4.2 unsigned int CNomadRNG::y = 362436069 `[static], [private]`

6.49.4.3 unsigned int CNomadRNG::z = 521288629 `[static], [private]`

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

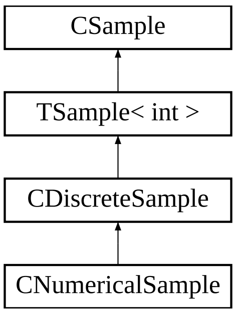
- C:/Development/core/RandomGenerators.h
- C:/Development/core/RandomGenerators.cpp

6.50 CNumericalSample Class Reference

Abstract class for numerical discrete samples.

`#include <Sample.h>`

Inheritance diagram for CNumericalSample:



Public Member Functions

- CNumericalSample ()
- CNumericalSample (const CNumericalSample &O)
- CNumericalSample (const CContinuousSample &O)
- virtual ∼CNumericalSample ()
- virtual void readSampleValue (std::ifstream &_ifs, int _at)

  Reads particular sample data from input file stream.
- virtual void writeSampleValue (std::ofstream &_ofs, int _at) const

  < Writes particular sample data to output file stream.
- virtual void setSampleSize (int _n)

  Sets particular sample data value.
- int minValue () const

  Returns minimal sample data value.
- int maxValue () const

  Returns maximal sample data value.
- virtual double variance () const

  Returns sample variance (i.e.empirical).

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- std::vector< double > values

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.50.1 Detailed Description

Abstract class for numerical discrete samples.

6.50.2 Constructor & Destructor Documentation

6.50.2.1 CNumericalSample::CNumericalSample ( ) `[inline]`

6.50.2.2 CNumericalSample::CNumericalSample (const CNumericalSample & *O*) `[inline]`

6.50.2.3 CNumericalSample::CNumericalSample (const CContinuousSample & *O*)

6.50.2.4 virtual CNumericalSample::∼CNumericalSample ( ) `[inline]`, `[virtual]`

6.50.3 Member Function Documentation

6.50.3.1 int CNumericalSample::maxValue ( ) const `[inline]`

Returns maximal sample data value.

Reimplemented from TSample< t >.

6.50.3.2 int CNumericalSample::minValue ( ) const `[inline]`

Returns minimal sample data value.

Reimplemented from TSample< t >.

6.50.3.3 void CNumericalSample::readSampleValue (std::ifstream & *_ifs*, int *_at*) `[virtual]`

Reads particular sample data from input file stream.

Reimplemented from TSample< t >.

6.50.3.4 template<class Archive > void CNumericalSample::serialize (Archive & *ar*, const unsigned int *version*) `[private]`

6.50.3.5 virtual void CNumericalSample::setSampleSize (int *_n*) `[inline]`, `[virtual]`

Sets particular sample data value.

Reimplemented from TSample< t >.

6.50.3.6 virtual double CNumericalSample::variance ( ) const `[inline]`, `[virtual]`

Returns sample variance (i.e.empirical).

Reimplemented from CDiscreteSample.

6.50.3.7 virtual void CNumericalSample::writeSampleValue (std::ofstream & _ofs, int _at) const [inline], [virtual]

< Writes particular sample data to output file stream.

Reimplemented from TSample< t >.

6.50.4 Friends And Related Function Documentation

6.50.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.50.5 Member Data Documentation

6.50.5.1 std::vector<double> CNumericalSample::values [private]

Holds all numerical values.

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

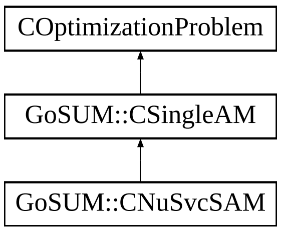
- C:/Development/core/Sample.h
- C:/Development/core/Sample.cpp

6.51 GoSUM::CNuSvcSAM Class Reference

Class for the analyitical model for single output state, nu-SVC type.

`#include <AnalyticalModel.h>`

Inheritance diagram for GoSUM::CNuSvcSAM:



Public Member Functions

- CNuSvcSAM ()
- virtual ~CNuSvcSAM ()

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Friends

- class boost::serialization::access
  Boost serialization.

Additional Inherited Members

6.51.1 Detailed Description

Class for the analyitical model for single output state, nu-SVC type.

6.51.2 Constructor & Destructor Documentation

6.51.2.1 GoSUM::CNuSvcSAM::CNuSvcSAM ( ) `[inline]`

6.51.2.2 virtual GoSUM::CNuSvcSAM::∼CNuSvcSAM ( ) `[inline], [virtual]`

6.51.3 Member Function Documentation

6.51.3.1 template<class Archive > void GoSUM::CNuSvcSAM::serialize (Archive & *ar*, const unsigned int *version*) `[protected]`

Reimplemented from GoSUM::CSingleAM.

6.51.4 Friends And Related Function Documentation

6.51.4.1 friend class boost::serialization::access `[friend]`

Boost serialization.

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

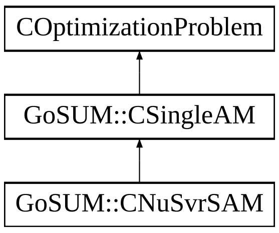
- C:/Development/core/AnalyticalModel.h
- C:/Development/core/AnalyticalModel.cpp

6.52 GoSUM::CNuSvrSAM Class Reference

Class for the analyitical model for single output state, nu-SVR type.

`#include <AnalyticalModel.h>`

Inheritance diagram for GoSUM::CNuSvrSAM:



Public Member Functions

- CNuSvrSAM ()
- virtual ∼CNuSvrSAM ()
- virtual void openOptimization ()

  Opens optmization.
- virtual void optimizationPoint2SVMParam (const ArrayXd &ov)

  Converts optimization point to SVM parameters.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.52.1 Detailed Description

Class for the analyitical model for single output state, nu-SVR type.

6.52.2 Constructor & Destructor Documentation

6.52.2.1 GoSUM::CNuSvrSAM::CNuSvrSAM ( ) [inline]

6.52.2.2 virtual GoSUM::CNuSvrSAM::∼CNuSvrSAM ( ) [inline], [virtual]

6.52.3 Member Function Documentation

6.52.3.1 void GoSUM::CNuSvrSAM::openOptimization ( ) [virtual]

Opens optmization.

Reimplemented from GoSUM::CSingleAM.

6.52.3.2 void GoSUM::CNuSvrSAM::optimizationPoint2SVMParam (const ArrayXd & *ov*) [virtual]

Converts optimization point to SVM parameters.

Reimplemented from GoSUM::CSingleAM.

6.52.3.3 template<class Archive > void GoSUM::CNuSvrSAM::serialize (Archive & *ar,* const unsigned int *version*) [protected]

Reimplemented from GoSUM::CSingleAM.

6.52.4 Friends And Related Function Documentation

6.52.4.1 friend class boost::serialization::access [friend]

Boost serialization.

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

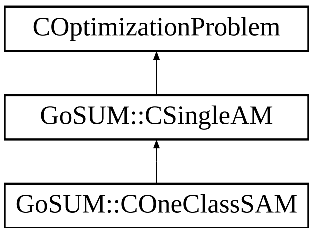
- C:/Development/core/AnalyticalModel.h
- C:/Development/core/AnalyticalModel.cpp

6.53 GoSUM::COneClassSAM Class Reference

Class for the analyitical model for single output state, one class type.

`#include <AnalyticalModel.h>`

Inheritance diagram for GoSUM::COneClassSAM:



Public Member Functions

- COneClassSAM ()
- virtual ∼COneClassSAM ()

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.53.1 Detailed Description

Class for the analyitical model for single output state, one class type.

6.53.2 Constructor & Destructor Documentation

6.53.2.1 GoSUM::COneClassSAM::COneClassSAM ( ) `[inline]`

6.53.2.2 virtual GoSUM::COneClassSAM::∼COneClassSAM ( ) `[inline]`, `[virtual]`

6.53.3 Member Function Documentation

6.53.3.1 template<class Archive > void GoSUM::COneClassSAM::serialize (Archive & *ar*, const unsigned int *version*) `[protected]`

Reimplemented from GoSUM::CSingleAM.

6.53.4 Friends And Related Function Documentation

6.53.4.1 friend class boost::serialization::access `[friend]`

Boost serialization.

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

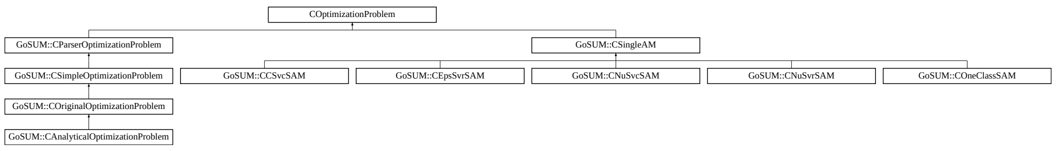
- C:/Development/core/AnalyticalModel.h
- C:/Development/core/AnalyticalModel.cpp

6.54 COptimizationProblem Class Reference

Class for the optimization problem.

`#include <OptimizationProblem.h>`

Inheritance diagram for COptimizationProblem:


COptimizationProblem
GoSUM::CParserOptimizationProblem
GoSUM::CSingleAM
GoSUM::CSimpleOptimizationProblem
GoSUM::CCSvcSAM
GoSUM::CEpsSvrSAM
GoSUM::CNuSvcSAM
GoSUM::CNuSvrSAM
GoSUM::COneClassSAM
GoSUM::COriginalOptimizationProblem
GoSUM::CAnalyticalOptimizationProblem

Public Member Functions

- COptimizationProblem ()
- virtual ∼COptimizationProblem ()
- virtual void clear ()

    Clears all.
- virtual void clearHistory ()

    Clears results.
- bool emptyHistory () const

    Returns true if results are empty. false otherwise.
- bool isMinimization ()

    Returns true if it is a minimization problem, false otherwise.
- bool isMaximization ()

    Returns true if it is a maximization problem, false otherwise.
- void setMinimization ()

    Sets optimization problem to minimization.
- void setMaximization ()

    Sets optimization problem to maximization.
- int dimension () const

    Returns dimension of the problem.
- COptimizationVariable ∗ addVariable (COptimizationVariable ∗_pOV)

    Adds optimization variable.
- void eraseVariable (int _at)

    Erases particular optimization variable.
- void setLowerBound (const ArrayXd &_xL)

    Sets lower bound of the optimization variables.
- void setUpperBound (const ArrayXd &_xU)

    Sets upper bound of the optimization variables.

- void setInitialValue (const ArrayXd &_x0)

    Sets initial value of the optimization variables.
- ArrayXd lowerBound () const

    Returns lower bound of the optimization variables.
- ArrayXd upperBound () const

    returns upper bound of the optimization variables.
- ArrayXd initialValue () const

    Returns initial value of the optimization variables.
- void setLowerBound (int _at, double _xL)

    Sets lower bound of the optimization variables.
- void setUpperBound (int _at, double _xU)

    Sets upper bound of the optimization variables.
- void setInitialValue (int _at, double _x0)

    Sets initial value of the optimization variables.
- double lowerBound (int _at) const

    Returns lower bound of the optimization variables.
- double upperBound (int _at) const

    Returns upper bound of the optimization variables.
- double initialValue (int _at) const

    Returns initial value of the optimization variables.
- virtual double objective (const ArrayXd &_ov)=0

    Evaluates objective function value from optimization variables values.
- virtual bool isFeasible (const ArrayXd &_ov)

    Returns true if optimization variable is feasible, false otherwise.
- virtual int constraintsSize () const =0

    Returns size of the constraints.
- virtual double constraint (const ArrayXd &_ov, int _at)=0

    Evalautes particular constraint value from optimization variables values.
- virtual bool evaluate (const ArrayXd &_hp, ArrayXd &_ep)

    Evaluates objective and all constraints from optimization variables values and returns true if it is feasible, false otherwise.
- virtual void openOptimization ()
- virtual void closeOptimization ()

    Opens, i.e. prepares optimization.
- void writeHistory (const ArrayXd &_ov, double _res)

    Closes optimization, i.e. closes what was opened in openOptimization.
- int historySize () const

    Returns history size.
- double objectiveHistory (int _i) const

    Returns particular objective history.
- double variableHistory (int _i, int _j) const

    Returns particular variable history.
- ArrayXd exportObjectiveHistory () const

    Exports objective history.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Protected Attributes

- bool minimize

  Indicates if it is a minimization problem.
- boost::ptr_vector
  < COptimizationVariable > ovs

  Holds all optimization variables.
- std::vector< std::pair
  < ArrayXd, double > > history

Friends

- class boost::serialization::access

  Boost serialization.

6.54.1 Detailed Description

Class for the optimization problem.

6.54.2 Constructor & Destructor Documentation

6.54.2.1 COptimizationProblem::COptimizationProblem ( ) [inline]

6.54.2.2 virtual COptimizationProblem::∼COptimizationProblem ( ) [inline], [virtual]

6.54.3 Member Function Documentation

6.54.3.1 COptimizationVariable* COptimizationProblem::addVariable (COptimizationVariable * _pOV) [inline]

Adds optimization variable.

6.54.3.2 virtual void COptimizationProblem::clear ( ) [inline], [virtual]

Clears all.

Reimplemented in GoSUM::CSimpleOptimizationProblem.

6.54.3.3 virtual void COptimizationProblem::clearHistory ( ) [inline], [virtual]

Clears results.

Reimplemented in GoSUM::CSimpleOptimizationProblem.

6.54.3.4 virtual void COptimizationProblem::closeOptimization ( ) [inline], [virtual]

Opens, i.e. prepares optimization.

Reimplemented in GoSUM::COriginalOptimizationProblem, GoSUM::CSimpleOptimizationProblem, and GoSUM::-CParserOptimizationProblem.

6.54.3.5 virtual double COptimizationProblem::constraint (const ArrayXd & *_ov*, int *_at*) [pure virtual]

Evalautes particular constraint value from optimization variables values.

Implemented in GoSUM::CSingleAM, and GoSUM::CParserOptimizationProblem.

6.54.3.6 virtual int COptimizationProblem::constraintsSize ( ) const [pure virtual]

Returns size of the constraints.

Implemented in GoSUM::CSingleAM, and GoSUM::CParserOptimizationProblem.

6.54.3.7 int COptimizationProblem::dimension ( ) const [inline]

Returns dimension of the problem.

6.54.3.8 bool COptimizationProblem::emptyHistory ( ) const [inline]

Returns true if results are empty. false otherwise.

6.54.3.9 void COptimizationProblem::eraseVariable (int *_at*)

Erases particular optimization variable.

6.54.3.10 bool COptimizationProblem::evaluate (const ArrayXd & *_hp*, ArrayXd & *_ep*) [virtual]

Evaluates objective and all constraints from optimization variables values and returns true if it is feasible, false otherwise.

Reimplemented in GoSUM::CSimpleOptimizationProblem.

6.54.3.11 ArrayXd COptimizationProblem::exportObjectiveHistory ( ) const

Exports objective history.

6.54.3.12 int COptimizationProblem::historySize ( ) const [inline]

Returns history size.

6.54.3.13 ArrayXd COptimizationProblem::initialValue ( ) const

Returns initial value of the optimization variables.

6.54.3.14 double COptimizationProblem::initialValue (int *_at*) const [inline]

Returns initial value of the optimization variables.

6.54.3.15 virtual bool COptimizationProblem::isFeasible (const ArrayXd & *_ov*) [inline], [virtual]

Returns true if optimization variable is feasible, false otherwise.

Reimplemented in GoSUM::CSimpleOptimizationProblem.

6.54.3.16 bool COptimizationProblem::isMaximization ( ) [inline]

Returns true if it is a maximization problem, false otherwise.

6.54.3.17 bool COptimizationProblem::isMinimization ( ) [inline]

Returns true if it is a minimization problem, false otherwise.

6.54.3.18 ArrayXd COptimizationProblem::lowerBound ( ) const

Returns lower bound of the optimization variables.

6.54.3.19 double COptimizationProblem::lowerBound (int _at) const [inline]

Returns lower bound of the optimization variables.

6.54.3.20 virtual double COptimizationProblem::objective (const ArrayXd & _ov) [pure virtual]

Evaluates objective function value from optimization variables values.

Implemented in GoSUM::CSingleAM, and GoSUM::CParserOptimizationProblem.

6.54.3.21 double COptimizationProblem::objectiveHistory (int _i) const [inline]

Returns particular objective history.

6.54.3.22 virtual void COptimizationProblem::openOptimization ( ) [inline], [virtual]

Reimplemented in GoSUM::CNuSvrSAM, GoSUM::CEpsSvrSAM, GoSUM::COriginalOptimizationProblem, GoSUM::CSimpleOptimizationProblem, GoSUM::CSingleAM, and GoSUM::CParserOptimizationProblem.

6.54.3.23 template<class Archive > void COptimizationProblem::serialize (Archive & ar, const unsigned int version) [inline], [protected]

Reimplemented in GoSUM::CNuSvrSAM, GoSUM::CAnalyticalOptimizationProblem, GoSUM::CEpsSvrSAM, GoSUM::COriginalOptimizationProblem, GoSUM::COneClassSAM, GoSUM::CNuSvcSAM, GoSUM::CSimpleOptimizationProblem, GoSUM::CCSvcSAM, GoSUM::CSingleAM, and GoSUM::CParserOptimizationProblem.

6.54.3.24 void COptimizationProblem::setInitialValue (const ArrayXd & _x0)

Sets initial value of the optimization variables.

6.54.3.25 void COptimizationProblem::setInitialValue (int _at, double _x0) [inline]

Sets initial value of the optimization variables.

6.54.3.26 void COptimizationProblem::setLowerBound (const ArrayXd & _xL)

Sets lower bound of the optimization variables.

6.54.3.27 void COptimizationProblem::setLowerBound (int *_at,* double *_xL*) [inline]

Sets lower bound of the optimization variables.

6.54.3.28 void COptimizationProblem::setMaximization ( ) [inline]

Sets optimization problem to maximization.

6.54.3.29 void COptimizationProblem::setMinimization ( ) [inline]

Sets optimization problem to minimization.

6.54.3.30 void COptimizationProblem::setUpperBound (const ArrayXd & *_xU*)

Sets upper bound of the optimization variables.

6.54.3.31 void COptimizationProblem::setUpperBound (int *_at,* double *_xU*) [inline]

Sets upper bound of the optimization variables.

6.54.3.32 ArrayXd COptimizationProblem::upperBound ( ) const

returns upper bound of the optimization variables.

6.54.3.33 double COptimizationProblem::upperBound (int *_at*) const [inline]

Returns upper bound of the optimization variables.

6.54.3.34 double COptimizationProblem::variableHistory (int *_i,* int *_j*) const [inline]

Returns particular variable history.

6.54.3.35 void COptimizationProblem::writeHistory (const ArrayXd & *_ov,* double *_res*)

Closes optimization, i.e. closes what was opened in openOptimization.

6.54.4 Friends And Related Function Documentation

6.54.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.54.5 Member Data Documentation

6.54.5.1 std::vector< std::pair<ArrayXd,double> > COptimizationProblem::history [protected]

Holds optimization history, i.e. sequence of best results up to every evaluation.

6.54.5.2 bool COptimizationProblem::minimize [protected]

Indicates if it is a minimization problem.

6.54.5.3 boost::ptr_vector<COptimizationVariable> COptimizationProblem::ovs [protected]

Holds all optimization variables.

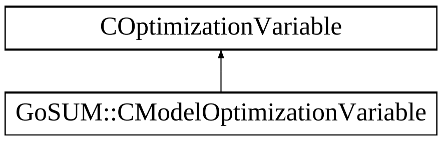
The documentation for this class was generated from the following files:

- C:/Development/core/OptimizationProblem.h
- C:/Development/core/OptimizationProblem.cpp

6.55 COptimizationVariable Class Reference

`#include <OptimizationProblem.h>`

Inheritance diagram for COptimizationVariable:



Public Member Functions

- COptimizationVariable ()
- COptimizationVariable (double _xL, double _xU, double _x0)
- COptimizationVariable (COptimizationVariable &_O)
- virtual ∼COptimizationVariable ()
- double lowerBound () const

    Returns lower bound.
- double upperBound () const

    Returns upper bound.
- double initialValue () const

    Returns initial value.
- void setLowerBound (double _xL)

    Sets lower bound.
- void setUpperBound (double _xU)

    Sets upper bound.
- void setInitialValue (double _x0)

    Sets inital value.
- void set (double _xL, double _xU, double _x0)

    Sets lower bound, upper bound, initial value.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Protected Attributes

- double xL
- double xU
- double x0

Friends

- class boost::serialization::access

  Boost serialization.

6.55.1 Constructor & Destructor Documentation

6.55.1.1 COptimizationVariable::COptimizationVariable ( ) [inline]

6.55.1.2 COptimizationVariable::COptimizationVariable (double *_xL*, double *_xU*, double *_x0*) [inline]

6.55.1.3 COptimizationVariable::COptimizationVariable (COptimizationVariable & *_O*) [inline]

6.55.1.4 virtual COptimizationVariable::∼COptimizationVariable ( ) [inline], [virtual]

6.55.2 Member Function Documentation

6.55.2.1 double COptimizationVariable::initialValue ( ) const [inline]

Returns initial value.

6.55.2.2 double COptimizationVariable::lowerBound ( ) const [inline]

Returns lower bound.

6.55.2.3 template<class Archive > void COptimizationVariable::serialize (Archive & *ar*, const unsigned int *version*) [inline], [protected]

Reimplemented in GoSUM::CModelOptimizationVariable.

6.55.2.4 void COptimizationVariable::set (double *_xL*, double *_xU*, double *_x0*)

Sets lower bound, upper bound, initial value.

6.55.2.5 void COptimizationVariable::setInitialValue (double *_x0*)

Sets inital value.

6.55.2.6 void COptimizationVariable::setLowerBound (double *_xL*)

Sets lower bound.

6.55.2.7 void COptimizationVariable::setUpperBound (double *_xU*)

Sets upper bound.

6.55.2.8 double COptimizationVariable::upperBound ( ) const [inline]

Returns upper bound.

6.55.3 Friends And Related Function Documentation

6.55.3.1 friend class boost::serialization::access [friend]

Boost serialization.

6.55.4 Member Data Documentation

6.55.4.1 double COptimizationVariable::x0 [protected]

Holds lower bound, upper bound and initial value of a optimization variable.

6.55.4.2 double COptimizationVariable::xL [protected]

6.55.4.3 double COptimizationVariable::xU [protected]

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

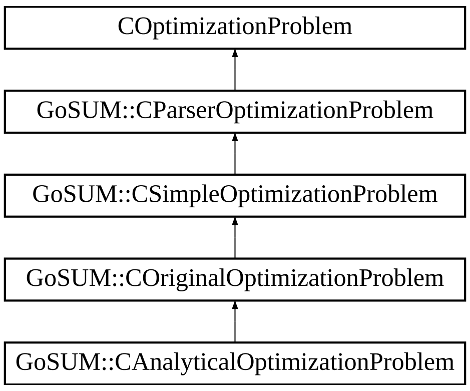
- C:/Development/core/OptimizationProblem.h
- C:/Development/core/OptimizationProblem.cpp

6.56 GoSUM::COriginalOptimizationProblem Class Reference

Class for the optimization problem based on GoSUM analyitical model.

`#include <ParserOptimizationProblem.h>`

Inheritance diagram for GoSUM::COriginalOptimizationProblem:


COptimizationProblem
GoSUM::CParserOptimizationProblem
GoSUM::CSimpleOptimizationProblem
GoSUM::COriginalOptimizationProblem
GoSUM::CAnalyticalOptimizationProblem

Public Member Functions

- COriginalOptimizationProblem (CInputParameters ∗_pIP, COutputStates ∗_pOS)
- virtual ∼COriginalOptimizationProblem ()
- virtual void openOptimization ()
- virtual void closeOptimization ()

Opens, i.e. prepares optimization.
- ArrayXd inputPoint2ModelPoint (const ArrayXd &_ip)

  Closes optimization, i.e. closes what was opened in openOptimization.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- COriginalOptimizationProblem ()
- virtual void setVariableNames ()

  Sets variable names for the parser.

Protected Attributes

- COutputStates ∗ pOS

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.56.1 Detailed Description

Class for the optimization problem based on GoSUM analyitical model.

6.56.2 Constructor & Destructor Documentation

6.56.2.1 GoSUM::COriginalOptimizationProblem::COriginalOptimizationProblem ( ) `[inline]`, `[protected]`

6.56.2.2 GoSUM::COriginalOptimizationProblem::COriginalOptimizationProblem (**CInputParameters** ∗ *_pIP*, **COutputStates** ∗ *_pOS*) `[inline]`

6.56.2.3 virtual GoSUM::COriginalOptimizationProblem::∼COriginalOptimizationProblem ( ) `[inline]`, `[virtual]`

6.56.3 Member Function Documentation

6.56.3.1 virtual void GoSUM::COriginalOptimizationProblem::closeOptimization ( ) `[inline]`, `[virtual]`

Opens, i.e. prepares optimization.

Reimplemented from GoSUM::CSimpleOptimizationProblem.

6.56.3.2 ArrayXd GoSUM::COriginalOptimizationProblem::inputPoint2ModelPoint (const ArrayXd & *_ip*)

Closes optimization, i.e. closes what was opened in openOptimization.

Converts input parameter point to model point.

Reimplemented from GoSUM::CSimpleOptimizationProblem.

Reimplemented in GoSUM::CAnalyticalOptimizationProblem.

6.56.3.3 virtual void GoSUM::COriginalOptimizationProblem::openOptimization ( ) [inline], [virtual]

Reimplemented from GoSUM::CSimpleOptimizationProblem.

6.56.3.4 template<class Archive > void GoSUM::COriginalOptimizationProblem::serialize (Archive & *ar,* const unsigned int *version*) [protected]

Reimplemented from GoSUM::CSimpleOptimizationProblem.

Reimplemented in GoSUM::CAnalyticalOptimizationProblem.

6.56.3.5 void GoSUM::COriginalOptimizationProblem::setVariableNames ( ) [protected], [virtual]

Sets variable names for the parser.

Reimplemented from GoSUM::CSimpleOptimizationProblem.

6.56.4 Friends And Related Function Documentation

6.56.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.56.5 Member Data Documentation

6.56.5.1 COutputStates* GoSUM::COriginalOptimizationProblem::pOS [protected]

Points to output states.

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

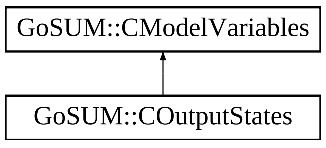
- C:/Development/core/ParserOptimizationProblem.h
- C:/Development/core/ParserOptimizationProblem.cpp

6.57 GoSUM::COutputStates Class Reference

Class for GoSUM output states.

`#include <Model.h>`

Inheritance diagram for GoSUM::COutputStates:



Public Member Functions

- COutputStates ()
- virtual ∼COutputStates ()
- bool setEvaluatorCompatible (const CInputParameters &inputs)
- void evaluate (const CInputParameters &inputs)

Starts end joins multiple threads for model function evaluation.
- void openEvaluation (const CInputParameters &inputs)
- ArrayXd evaluate (const ArrayXd &X)

  Opens evaluation on single input parameter n-tuples.
- void closeEvaluation ()
- void setProgressSlot (boost::function< void()> _progressSlot)

  Sets external progress slot.

Public Attributes

- boost::function< void()> progressSlot

  Closes evaluation on single input parameter n-tuples.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- GoSUM::CModelEvaluator ∗ pE

Friends

- class boost::serialization::access

  boost serialization

Additional Inherited Members

6.57.1 Detailed Description

Class for GoSUM output states.

6.57.2 Constructor & Destructor Documentation

6.57.2.1 GoSUM::COutputStates::COutputStates ( ) [inline]

6.57.2.2 virtual GoSUM::COutputStates::∼COutputStates ( ) [inline], [virtual]

6.57.3 Member Function Documentation

6.57.3.1 void GoSUM::COutputStates::closeEvaluation ( )

6.57.3.2 void GoSUM::COutputStates::evaluate (const CInputParameters & *inputs*)

Starts end joins multiple threads for model function evaluation.

6.57.3.3 ArrayXd GoSUM::COutputStates::evaluate (const ArrayXd & *X*)

Opens evaluation on single input parameter n-tuples.

Evaluates output state on single input parameter n-tuple.

6.57.3.4 void GoSUM::COutputStates::openEvaluation (const **CInputParameters** & *inputs*)

6.57.3.5 template< class Archive > void GoSUM::COutputStates::serialize (Archive & *ar,* const unsigned int *version*) `[private]`

6.57.3.6 bool GoSUM::COutputStates::setEvaluatorCompatible (const **CInputParameters** & *inputs*)

6.57.3.7 void GoSUM::COutputStates::setProgressSlot (boost::function< void()> *_progressSlot*) `[inline]`

Sets external progress slot.

6.57.4 Friends And Related Function Documentation

6.57.4.1 friend class boost::serialization::access `[friend]`

boost serialization

6.57.5 Member Data Documentation

6.57.5.1 **GoSUM::CModelEvaluator**$*$ GoSUM::COutputStates::pE `[private]`

Holds pointer to model evalautor used for single evaluations.

6.57.5.2 boost::function<void()> GoSUM::COutputStates::progressSlot

Closes evaluation on single input parameter n-tuples.

External progress slot, later connected to signal for evalaution progress.

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

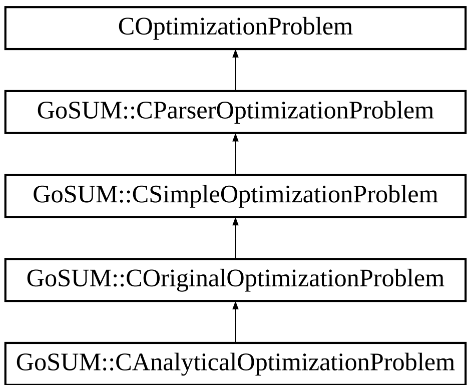
- C:/Development/core/Model.h
- C:/Development/core/Model.cpp

6.58 GoSUM::CParserOptimizationProblem Class Reference

Class for the optimization problem with parser functions.

`#include <ParserOptimizationProblem.h>`

Inheritance diagram for GoSUM::CParserOptimizationProblem:


COptimizationProblem
GoSUM::CParserOptimizationProblem
GoSUM::CSimpleOptimizationProblem
GoSUM::COriginalOptimizationProblem
GoSUM::CAnalyticalOptimizationProblem

Public Member Functions

- CParserOptimizationProblem ()
- virtual ∼CParserOptimizationProblem ()
- void setObjectiveExpression (const std::string &_fexpr)

    Sets objective expression.
- std::string objectiveExpression ()

    Returns objective expression.
- virtual int constraintsSize () const

    Returns size of the constraints.
- void clearConstraintExpressions ()

    Clears constraints expressions.
- void addConstraintExpression (const std::string &_gexpr)

    Adds constraint expression.
- void eraseConstraintExpression (int _at)

    Erases particular constraint expression.
- void setConstraintExpression (const std::string &_gexpr, int _at)

    Sets particular constraint expression.
- std::string constraintExpression (int _at)

    Returns particular constraint expression.
- std::string roundoffEquality (std::string _expr)

    If _expr is an equality expression left=right it returns expression abs(left-right)<=TINY.
- bool validateExpressions ()

    Validates all expressions.
- void parseExpressions ()

    Parses all expressions.
- virtual void openOptimization ()
- virtual void closeOptimization ()

    Opens, i.e. prepares optimization.
- double objective (const ArrayXd &_mv)

    Closes optimization, i.e. closes what was opened in openOptimization.
- double constraint (const ArrayXd &_mv, int _at)

    Evalautes particular constraint value from model variables values.

Public Attributes

- boost::signal< void()> optimizingProgressed

    Signal for optimizing progress, emitted on single objective evaluation.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- virtual void setVariableNames ()=0

    Sets variable names for the parser.

Protected Attributes

- std::string names

  Holds all names that are permited in objective and constraint expressions.
- std::string fexpr

  Holds objective function expression.
- std::vector< std::string > gexpr

  Holds expressions for constraints.
- FunctionParser f

  Holds function parser for objective function.
- std::vector< FunctionParser > g

Friends

- class boost::serialization::access

  Boost serialization.

6.58.1 Detailed Description

Class for the optimization problem with parser functions.

6.58.2 Constructor & Destructor Documentation

6.58.2.1 GoSUM::CParserOptimizationProblem::CParserOptimizationProblem ( ) `[inline]`

6.58.2.2 virtual GoSUM::CParserOptimizationProblem::∼CParserOptimizationProblem ( ) `[inline]`, `[virtual]`

6.58.3 Member Function Documentation

6.58.3.1 void GoSUM::CParserOptimizationProblem::addConstraintExpression (const std::string & *_gexpr*) `[inline]`

Adds constraint expression.

6.58.3.2 void GoSUM::CParserOptimizationProblem::clearConstraintExpressions ( ) `[inline]`

Clears constraints expressions.

6.58.3.3 void GoSUM::CParserOptimizationProblem::closeOptimization ( ) `[virtual]`

Opens, i.e. prepares optimization.

Reimplemented from COptimizationProblem.

Reimplemented in GoSUM::COriginalOptimizationProblem, and GoSUM::CSimpleOptimizationProblem.

6.58.3.4 double GoSUM::CParserOptimizationProblem::constraint (const ArrayXd & *_mv,* int *_at*) `[inline]`, `[virtual]`

Evalautes particular constraint value from model variables values.

Implements COptimizationProblem.

6.58.3.5 std::string GoSUM::CParserOptimizationProblem::constraintExpression (int *_at*) [inline]

Returns particular constraint expression.

6.58.3.6 virtual int GoSUM::CParserOptimizationProblem::constraintsSize ( ) const [inline], [virtual]

Returns size of the constraints.

Implements COptimizationProblem.

6.58.3.7 void GoSUM::CParserOptimizationProblem::eraseConstraintExpression (int *_at*)

Erases particular constraint expression.

6.58.3.8 double GoSUM::CParserOptimizationProblem::objective (const ArrayXd & *_mv*) [inline], [virtual]

Closes optimization, i.e. closes what was opened in openOptimization.

Evaluates objective function value from model variables values.

Implements COptimizationProblem.

6.58.3.9 std::string GoSUM::CParserOptimizationProblem::objectiveExpression ( ) [inline]

Returns objective expression.

6.58.3.10 void GoSUM::CParserOptimizationProblem::openOptimization ( ) [virtual]

Reimplemented from COptimizationProblem.

Reimplemented in GoSUM::COriginalOptimizationProblem, and GoSUM::CSimpleOptimizationProblem.

6.58.3.11 void GoSUM::CParserOptimizationProblem::parseExpressions ( )

Parses all expressions.

6.58.3.12 std::string GoSUM::CParserOptimizationProblem::roundoffEquality (std::string *_expr*)

If _expr is an equality expression left=right it returns expression abs(left-right)<=TINY.

6.58.3.13 template<class Archive > void GoSUM::CParserOptimizationProblem::serialize (Archive & *ar,* const unsigned int *version*) [protected]

Reimplemented from COptimizationProblem.

Reimplemented in GoSUM::CAnalyticalOptimizationProblem, GoSUM::COriginalOptimizationProblem, and GoSUM::CSimpleOptimizationProblem.

6.58.3.14 void GoSUM::CParserOptimizationProblem::setConstraintExpression (const std::string & *_gexpr,* int *_at*)

Sets particular constraint expression.

6.58.3.15 void GoSUM::CParserOptimizationProblem::setObjectiveExpression (const std::string & *_fexpr*) [inline]

Sets objective expression.

6.58.3.16 virtual void GoSUM::CParserOptimizationProblem::setVariableNames ( ) [protected], [pure virtual]

Sets variable names for the parser.

Implemented in GoSUM::COriginalOptimizationProblem, and GoSUM::CSimpleOptimizationProblem.

6.58.3.17 bool GoSUM::CParserOptimizationProblem::validateExpressions ( )

Validates all expressions.

6.58.4 Friends And Related Function Documentation

6.58.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.58.5 Member Data Documentation

6.58.5.1 FunctionParser GoSUM::CParserOptimizationProblem::f [protected]

Holds function parser for objective function.

6.58.5.2 std::string GoSUM::CParserOptimizationProblem::fexpr [protected]

Holds objective function expression.

6.58.5.3 std::vector<FunctionParser> GoSUM::CParserOptimizationProblem::g [protected]

Holds function parsers for constraints.

6.58.5.4 std::vector<std::string> GoSUM::CParserOptimizationProblem::gexpr [protected]

Holds expressions for constraints.

6.58.5.5 std::string GoSUM::CParserOptimizationProblem::names [protected]

Holds all names that are permited in objective and constraint expressions.

6.58.5.6 boost::signal<void()> GoSUM::CParserOptimizationProblem::optimizingProgressed

Signal for optimizing progress, emitted on single objective evaluation.

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

- C:/Development/core/ParserOptimizationProblem.h
- C:/Development/core/ParserOptimizationProblem.cpp

6.59 CPlot2D Class Reference

```
#include <Plot2D.h>
```

Public Member Functions

- CPlot2D ()
- virtual ∼CPlot2D ()
- QwtPlotCanvas ∗ canvas ()

  Returns pointer to plot canvas.
- void newPlot (QWidget ∗pwidget, double xmin, double xmax, double ymin, double ymax, double lymin, double lymax)

  Creates new 2D plot with given min and max values on the axis.
- void newColorBarPlot (QWidget ∗pwidget, double xmin, double xmax, double ymin, double ymax, double zmin, double zmax)

  Creates new 2D plot with given min and max values on the axis.
- void setTitles (string title, Qt::GlobalColor clr, string btitle, Qt::GlobalColor bclr, string ttitle, Qt::GlobalColor tclr, string ltitle, Qt::GlobalColor lclr, string rtitle, Qt::GlobalColor rclr)
- void replot ()

  Sets titles (text and color) for all axis.
- void clear ()

  Clears object.
- void plotWithPen (const ArrayXd &X, const ArrayXd &Y, string name, Qt::GlobalColor clr)

  Plots data using pen.
- void plotWithSymbol (const ArrayXd &X, const ArrayXd &Y, string name, Qt::GlobalColor clr)

  Plots data using symbols.
- void plotWithSymbol (const std::vector< double > &X, const std::vector< double > &Y, string name, Qt::-GlobalColor clr)

  Plots data using symbols.
- void plotWithHistogram (const ArrayXi &Xi, const ArrayXd &H, string name, Qt::GlobalColor clr)

  Plots data using histogram.
- void plotWithHistogram (const ArrayXd &X, const ArrayXd &H, string name, Qt::GlobalColor clr)

  Plots data using histogram.
- void plotWithSpectrogram (const ArrayXXd &A, const std::vector< std::string > &xlabels, const std::vector< std::string > &ylabels)

  Plots data using spectrogram.
- QwtPlot ∗ getPlot ()

  Returns the QwtPlot object.

Private Member Functions

- QwtLinearColorMap ∗ newColorMap ()

Private Attributes

- QwtPlot ∗ plot

  Holds pointer to the QwtPlot object.

6.59.1 Constructor & Destructor Documentation

6.59.1.1 CPlot2D::CPlot2D ( ) `[inline]`

6.59.1.2 virtual CPlot2D::∼CPlot2D ( ) `[inline]`, `[virtual]`

6.59.2 Member Function Documentation

6.59.2.1 QwtPlotCanvas ∗ CPlot2D::canvas ( )

Returns pointer to plot canvas.

6.59.2.2 void CPlot2D::clear ( ) `[inline]`

Clears object.

6.59.2.3 QwtPlot∗ CPlot2D::getPlot ( ) `[inline]`

Returns the QwtPlot object.

6.59.2.4 void CPlot2D::newColorBarPlot (QWidget ∗ *pwidget,* double *xmin,* double *xmax,* double *ymin,* double *ymax,* double *zmin,* double *zmax*)

Creates new 2D plot with given min and max values on the axis.

6.59.2.5 QwtLinearColorMap ∗ CPlot2D::newColorMap ( ) `[private]`

6.59.2.6 void CPlot2D::newPlot (QWidget ∗ *pwidget,* double *xmin,* double *xmax,* double *ymin,* double *ymax,* double *lymin,* double *lymax*)

Creates new 2D plot with given min and max values on the axis.

6.59.2.7 void CPlot2D::plotWithHistogram (const ArrayXi & *Xi,* const ArrayXd & *H,* string *name,* Qt::GlobalColor *clr*)

Plots data using histogram.

6.59.2.8 void CPlot2D::plotWithHistogram (const ArrayXd & *X,* const ArrayXd & *H,* string *name,* Qt::GlobalColor *clr*)

Plots data using histogram.

6.59.2.9 void CPlot2D::plotWithPen (const ArrayXd & *X,* const ArrayXd & *Y,* string *name,* Qt::GlobalColor *clr*)

Plots data using pen.

6.59.2.10 void CPlot2D::plotWithSpectrogram (const ArrayXXd & *A,* const std::vector< std::string > & *xlabels,* const std::vector< std::string > & *ylabels*)

Plots data using spectrogram.

6.59.2.11 void CPlot2D::plotWithSymbol (const ArrayXd & *X*, const ArrayXd & *Y*, string *name*, Qt::GlobalColor *clr*)

Plots data using symbols.

6.59.2.12 void CPlot2D::plotWithSymbol (const std::vector< double > & *X*, const std::vector< double > & *Y*, string *name*, Qt::GlobalColor *clr*)

Plots data using symbols.

6.59.2.13 void CPlot2D::replot ( ) `[inline]`

Sets titles (text and color) for all axis.

Replots the 2D plot.

6.59.2.14 void CPlot2D::setTitles (string *title*, Qt::GlobalColor *clr*, string *btitle*, Qt::GlobalColor *bclr*, string *ttitle*, Qt::GlobalColor *tclr*, string *ltitle*, Qt::GlobalColor *lclr*, string *rtitle*, Qt::GlobalColor *rclr*)

6.59.3 Member Data Documentation

6.59.3.1 QwtPlot* CPlot2D::plot `[private]`

Holds pointer to the QwtPlot object.

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

- C:/Development/core/Plot2D.h
- C:/Development/core/Plot2D.cpp

6.60 CRandomGenerator Class Reference

Class that holds all implemented uniform RNGs as static. and allows switching between them.

`#include <RandomGenerators.h>`

Public Types

- enum rngtype {
  smallperiod, mediumperiod, nonlinearcongruential, largeperiod,
  dynamicsystem, nomads }

Static Public Member Functions

- static rngtype Type (std::string _stype)

  Converts rng type name (string) to rngtype enumerator.
- static void Set (rngtype _type, unsigned int s=111)

  Sets RNG of rngtype _type as active.
- static void SetSmallPeriod (unsigned int s=111)

  Sets small period RNG as active.
- static void SetMediumPeriod (unsigned int s=111)

  Sets medium period RNG as active.
- static void SetNonlinearCongruential (unsigned int s=111)

Sets non lienarily congruential RNG as active.

- static void SetLargePeriod (unsigned int s=111)

    Sets large period RNG as active.
- static void SetDynamicSystem (unsigned int s)

    Sets dynamic system RNG as active.
- static void SetNomads (unsigned int s=111)

    Sets dynamic system RNG as active.
- static rngtype & Type ()

    Returns type of the active RNG.
- static void SetSeed (unsigned int s)

    Sets seed of the active RNG.
- static unsigned int RndInt ()

    Returns an unsigned int randomly generated by the active RNG.
- static double Rnd ()

    Returns a double between 0 and 1 randomly generated by the active RNG.
- static double Rnd (double a, double b)

    Returns a double between a and b randomly generated by the active RNG.

Static Private Attributes

- static CSmallPeriodRNG sp

    Small period RNG, static.
- static CMediumPeriodRNG mp

    Medium period RNG, static.
- static CNLCRNG nlc

    Non linearily congruential RNG, static.
- static CLargePeriodRNG lp

    Large period RNG, static.
- static CDynamicSystemRNG ds

    Dynamic system RNG, static.
- static CNomadRNG mad

    Dynamic system RNG, static.
- static CBaseRNG $*$ p = &CRandomGenerator::ds

    Poitner to the active RNG, static.
- static enum rngtype type = CRandomGenerator::dynamicsystem

    Type of the active RNG.

6.60.1 Detailed Description

Class that holds all implemented uniform RNGs as static. and allows switching between them.

6.60.2 Member Enumeration Documentation

6.60.2.1 enum CRandomGenerator::rngtype

Enumerator:

smallperiod
mediumperiod
nonlinearcongruential
largeperiod
dynamicsystem
nomads

6.60.3 Member Function Documentation

6.60.3.1 static double CRandomGenerator::Rnd ( ) [inline], [static]

Returns a double between 0 and 1 randomly generated by the active RNG.

6.60.3.2 static double CRandomGenerator::Rnd (double *a*, double *b*) [inline], [static]

Returns a double between a and b randomly generated by the active RNG.

6.60.3.3 static unsigned int CRandomGenerator::RndInt ( ) [inline], [static]

Returns an unsigned int randomly generated by the active RNG.

6.60.3.4 void CRandomGenerator::Set (rngtype *_type*, unsigned int *s* = 111) [static]

Sets RNG of rngtype _type as active.

6.60.3.5 static void CRandomGenerator::SetDynamicSystem (unsigned int *s*) [inline], [static]

Sets dynamic system RNG as active.

6.60.3.6 static void CRandomGenerator::SetLargePeriod (unsigned int *s* = 111) [inline], [static]

Sets large period RNG as active.

6.60.3.7 static void CRandomGenerator::SetMediumPeriod (unsigned int *s* = 111) [inline], [static]

Sets medium period RNG as active.

6.60.3.8 static void CRandomGenerator::SetNomads (unsigned int *s* = 111) [inline], [static]

Sets dynamic system RNG as active.

6.60.3.9 static void CRandomGenerator::SetNonlinearCongruential (unsigned int *s* = 111) [inline], [static]

Sets non lienarily congruential RNG as active.

6.60.3.10 static void CRandomGenerator::SetSeed (unsigned int *s*) [inline], [static]

Sets seed of the active RNG.

6.60.3.11 static void CRandomGenerator::SetSmallPeriod (unsigned int *s* = 111) [inline], [static]

Sets small period RNG as active.

6.60.3.12 CRandomGenerator::rngtype CRandomGenerator::Type (std::string *_stype*) [static]

Converts rng type name (string) to rngtype enumerator.

6.60.3.13 static rngtype& CRandomGenerator::Type ( ) [inline], [static]

Returns type of the active RNG.

6.60.4 Member Data Documentation

6.60.4.1 CDynamicSystemRNG CRandomGenerator::ds [static], [private]

Dynamic system RNG, static.

6.60.4.2 CLargePeriodRNG CRandomGenerator::lp [static], [private]

Large period RNG, static.

6.60.4.3 CNomadRNG CRandomGenerator::mad [static], [private]

Dynamic system RNG, static.

6.60.4.4 CMediumPeriodRNG CRandomGenerator::mp [static], [private]

Medium period RNG, static.

6.60.4.5 CNLCRNG CRandomGenerator::nlc [static], [private]

Non linearily congruential RNG, static.

6.60.4.6 CBaseRNG ∗ CRandomGenerator::p = &CRandomGenerator::ds [static], [private]

Poitner to the active RNG, static.

6.60.4.7 CSmallPeriodRNG CRandomGenerator::sp [static], [private]

Small period RNG, static.

6.60.4.8 CRandomGenerator::rngtype CRandomGenerator::type = CRandomGenerator::dynamicsystem [static], [private]

Type of the active RNG.

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

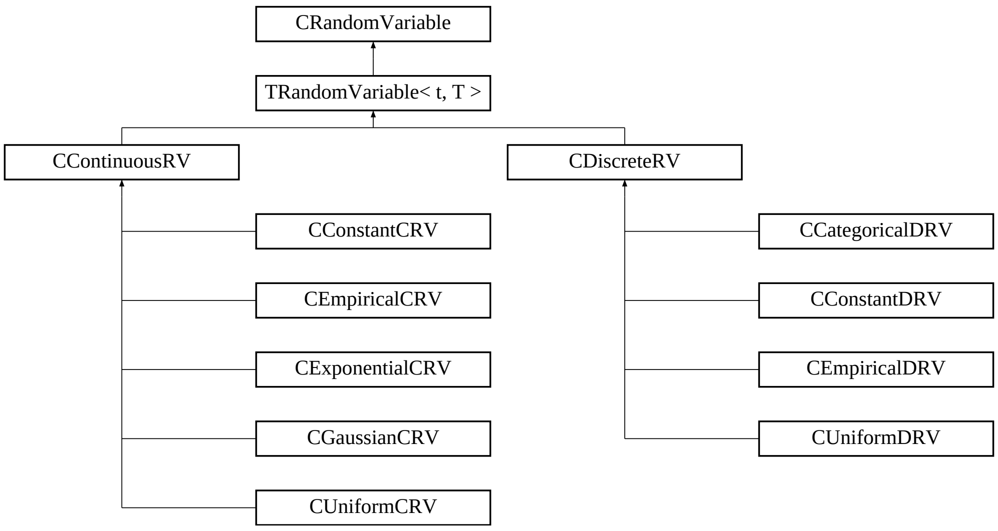
- C:/Development/core/RandomGenerators.h
- C:/Development/core/RandomGenerators.cpp

6.61 CRandomVariable Class Reference

Abstract base class for all random variables.

`#include <RandomVariable.h>`

Inheritance diagram for CRandomVariable:



Public Types

- enum distributiontype {
  constantdiscrete, uniformdiscrete, empiricaldiscrete, categorical,
  constantcontinuous, uniformcontinuous, gaussian, exponential,
  empiricalcontinuous }

Public Member Functions

- CRandomVariable ()
- virtual ∼CRandomVariable ()
- CRandomVariable (const CRandomVariable &O)
- virtual double quantile (double _p) const =0

  Returns quantile (inverse cumulative distribution function, probit function) of _p in [0,1].
- virtual int expandedSize () const
- virtual double minValue () const =0

  Returns number of variables after expansion for SVM and similar, 1 except in cateogrical variable.
- virtual double maxValue () const =0

  Returns maximal value of the random variable.
- virtual double expectedValue () const =0

  Returns expected value of the random variable.
- virtual distributiontype distributionType () const =0

  Returns enum type of the random variable distribution.
- virtual std::string distributionName () const =0

  Returns name of the random variable distribution.
- virtual bool isDistributionDefined () const

  Returns true if distribution is defined, false otherwise.
- virtual double variance () const =0

  Returns variance of the random variable.

Static Public Member Functions

- static distributiontype Type (std::string _stype)

  Converts distribution name (string) to distributiontype enumerator.
- static bool IsDistributionType (std::string _stype)

Returns true if it is a distribution type, false otherwise.

- static bool IsEmpirical (distributiontype _type)

  Returns true if distribution type is empirical, false otherwise.
- static bool IsTheoretical (distributiontype _type)

  Returns true if distribution type is theoretical, false otherwise.
- static bool IsDiscrete (distributiontype _type)

  Returns true if distribution type is discrete, false otherwise.
- static bool IsContinuous (distributiontype _type)

  Returns true if distribution type is continuous, false otherwise.
- static int DistributionParametersSize (distributiontype _type)

  Returns size (number of) distribution parameters.

Protected Member Functions

- virtual double doQuantile (double _p) const =0

  Quantile, formula implementation without checking argument.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Friends

- class boost::serialization::access

  Boost serialization.

6.61.1 Detailed Description

Abstract base class for all random variables.

6.61.2 Member Enumeration Documentation

6.61.2.1 enum **CRandomVariable::distributiontype**

Enumerator:

constantdiscrete

uniformdiscrete

empiricaldiscrete

categorical

constantcontinuous

uniformcontinuous

gaussian

exponential

empiricalcontinuous

6.61.3 Constructor & Destructor Documentation

6.61.3.1 CRandomVariable::CRandomVariable ( ) [inline]

6.61.3.2 virtual CRandomVariable::∼CRandomVariable ( ) [inline], [virtual]

6.61.3.3 CRandomVariable::CRandomVariable (const CRandomVariable & *O*) [inline]

6.61.4 Member Function Documentation

6.61.4.1 virtual std::string CRandomVariable::distributionName ( ) const [pure virtual]

Returns name of the random variable distribution.

Implemented in CEmpiricalCRV, CExponentialCRV, CGaussianCRV, CUniformCRV, CConstantCRV, C-CategoricalDRV, CEmpiricalDRV, CUniformDRV, and CConstantDRV.

6.61.4.2 int CRandomVariable::DistributionParametersSize (CRandomVariable::distributiontype *_type*) [static]

Returns size (number of) distribution parameters.

6.61.4.3 virtual distributiontype CRandomVariable::distributionType ( ) const [pure virtual]

Returns enum type of the random variable distribution.

Implemented in CEmpiricalCRV, CExponentialCRV, CGaussianCRV, CUniformCRV, CConstantCRV, C-CategoricalDRV, CEmpiricalDRV, CUniformDRV, and CConstantDRV.

6.61.4.4 virtual double CRandomVariable::doQuantile (double *_p*) const [protected], [pure virtual]

Quantile, formula implementation without checking argument.

Implemented in CEmpiricalCRV, CExponentialCRV, CGaussianCRV, CUniformCRV, CConstantCRV, C-CategoricalDRV, CEmpiricalDRV, CUniformDRV, and CConstantDRV.

6.61.4.5 virtual int CRandomVariable::expandedSize ( ) const [inline], [virtual]

Reimplemented in CCategoricalDRV, and CEmpiricalDRV.

6.61.4.6 virtual double CRandomVariable::expectedValue ( ) const [pure virtual]

Returns expected value of the random variable.

Implemented in CEmpiricalCRV, CExponentialCRV, CGaussianCRV, CUniformCRV, CConstantCRV, C-CategoricalDRV, CEmpiricalDRV, CUniformDRV, and CConstantDRV.

6.61.4.7 bool CRandomVariable::IsContinuous (CRandomVariable::distributiontype *_type*) [static]

Returns true if distribution type is continuous, false otherwise.

6.61.4.8 bool CRandomVariable::IsDiscrete (CRandomVariable::distributiontype *_type*) [static]

Returns true if distribution type is discrete, false otherwise.

6.61.4.9 virtual bool CRandomVariable::isDistributionDefined ( ) const [inline], [virtual]

Returns true if distribution is defined, false otherwise.

Reimplemented in CEmpiricalCRV, CCategoricalDRV, and CEmpiricalDRV.

6.61.4.10 bool CRandomVariable::IsDistributionType (std::string _stype) [static]

Returns true if it is a distribution type, false otherwise.

6.61.4.11 bool CRandomVariable::IsEmpirical (CRandomVariable::distributiontype _type) [static]

Returns true if distribution type is empirical, false otherwise.

6.61.4.12 bool CRandomVariable::IsTheoretical (CRandomVariable::distributiontype _type) [static]

Returns true if distribution type is theoretical, false otherwise.

6.61.4.13 virtual double CRandomVariable::maxValue ( ) const [pure virtual]

Returns maximal value of the random variable.

Implemented in CEmpiricalCRV, CExponentialCRV, CGaussianCRV, CUniformCRV, CConstantCRV, C-CategoricalDRV, CEmpiricalDRV, CUniformDRV, and CConstantDRV.

6.61.4.14 virtual double CRandomVariable::minValue ( ) const [pure virtual]

Returns number of variables after expansion for SVM and similar, 1 except in cateogrical variable.

Returns minimal value of the random variable.

Implemented in CEmpiricalCRV, CExponentialCRV, CGaussianCRV, CUniformCRV, CConstantCRV, C-CategoricalDRV, CEmpiricalDRV, CUniformDRV, and CConstantDRV.

6.61.4.15 virtual double CRandomVariable::quantile (double _p) const [pure virtual]

Returns quantile (inverse cumulative distribution function, probit function) of _p in [0,1].

Implemented in CContinuousRV, and CDiscreteRV.

6.61.4.16 template<class Archive > void CRandomVariable::serialize (Archive & ar, const unsigned int version) [inline], [private]

6.61.4.17 CRandomVariable::distributiontype CRandomVariable::Type (std::string _stype) [static]

Converts distribution name (string) to distributiontype enumerator.

6.61.4.18 virtual double CRandomVariable::variance ( ) const [pure virtual]

Returns variance of the random variable.

Implemented in CEmpiricalCRV, CExponentialCRV, CGaussianCRV, CUniformCRV, CConstantCRV, C-CategoricalDRV, CEmpiricalDRV, CUniformDRV, and CConstantDRV.

6.61.5 Friends And Related Function Documentation

6.61.5.1 friend class boost::serialization::access [friend]

Boost serialization.

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

- C:/Development/core/RandomVariable.h
- C:/Development/core/RandomVariable.cpp

6.62 GoSUM::CReduction Class Reference

Class for sensitivity analyis of the model.

`#include <Reduction.h>`

Public Types

- enum reductiontype {
  derivative, averagederivative, absoluteaveragederivative, variance,
  anova }
- enum cutofftype { cutoffvalue, cutoffsize }

Public Member Functions

- CReduction (CInputParameters ∗_pIP, COutputStates ∗_pOS, CAnalyticalModel ∗_pAM, CSensitivityAnalysis ∗_pSA)
- virtual ∼CReduction ()
- void clear ()

  Clears data.
- void initialize ()

  Initializes reducing.
- const ArrayXXd & sensitivityIndex ()

  Returns actual sensitivitiy index.
- void setReductionType (enum reductiontype _redtype)

  Sets reduction type.
- void evaluateMaximalSensitivities ()

  Evaluates maximal indices for all input parameters relative to selected output states.
- void selectInputParameters ()

  Cuts by actual cutoff criteria.
- int cutoffSize () const

  Returns cutoff size.
- double cutoffValue () const

  return cutoff value.
- void setCutoffSize (int _cutip)

  Sets cutoff size.
- void setCutoffValue (double _cutval)

  Sets cutoff value.
- void selectOutputState (int _o)

  Selects output state for reduction criteria.
- void selectOutputs (const std::vector< std::string > &_selOS)

Selects output states named in the _selOS.
- bool isSelectedOutputState (int _o) const

  Returns true if particular output state is selected, false otherwise.
- bool isSelectedInputParameter (int _i) const

  Returns true if particular input parameter is selected, false otherwise.
- double maximalSensitivity (int _i)

  Returns maximal (relative to selected output states) sensitivity index for particular input parameter.
- double maximalSensitivity ()

  Returns maximal (relative to selected output states) sensitivity index.
- void eraseNonSelectedVariables ()

  Reduces the model, i.e. deletes all input paramters and output states that are not selected.

Static Public Member Functions

- static reductiontype ReductionType (const std::string &_stype)

  Converts reduction type name (string) to reductiontype enumerator.
- static reductiontype ReductionType ()

  Returns actual reduction type.
- static cutofftype CutoffType ()

  Returns actual criteria type.
- static void SetReductionType (enum reductiontype _redtype)

  Sets reduction type.
- static void SetCutoffType (enum cutofftype _cuttype)

  Sets reduction type.

Static Public Attributes

- static enum reductiontype redtype

  Holds actual reduction type.
- static enum cutofftype cuttype

  Holds actual criteria type.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- CReduction ()

Private Attributes

- CInputParameters ∗ pIP

  Points to input parameters.
- COutputStates ∗ pOS

  Points to output states.
- CAnalyticalModel ∗ pAM

  Points to the analytical model.
- CSensitivityAnalysis ∗ pSA

  Points to the sensitivity analysis.
- std::vector< std::pair< double,
  bool > > rankIP

Holds pairs of input parameter appropriate maximal sensitivity indices (relative to selected output states), it sorted in descending order and appropraite selection status.
- std::vector< bool > rankOS

  Holds pairs of output state names and appropriate selection status.
- double cutval

  Holds cutoff value.
- int cutip

  Holds size of the selected inputs.
- int cutos

Friends

- class boost::serialization::access

  Boost serialization.

6.62.1 Detailed Description

Class for sensitivity analyis of the model.

6.62.2 Member Enumeration Documentation

6.62.2.1 enum **GoSUM::CReduction::cutofftype**

Enumerator:

cutoffvalue

cutoffsize

6.62.2.2 enum **GoSUM::CReduction::reductiontype**

Enumerator:

derivative

averagederivative

absoluteaveragederivative

variance

anova

6.62.3 Constructor & Destructor Documentation

6.62.3.1 GoSUM::CReduction::CReduction ( ) `[inline]`, `[private]`

6.62.3.2 GoSUM::CReduction::CReduction (**CInputParameters** ∗ *_pIP,* **COutputStates** ∗ *_pOS,* **CAnalyticalModel** ∗ *_pAM,* **CSensitivityAnalysis** ∗ *_pSA*) `[inline]`

6.62.3.3 virtual GoSUM::CReduction::∼CReduction ( ) `[inline]`, `[virtual]`

6.62.4 Member Function Documentation

6.62.4.1 void GoSUM::CReduction::clear ( ) `[inline]`

Clears data.

6.62.4.2 int GoSUM::CReduction::cutoffSize ( ) const [inline]

Returns cutoff size.

6.62.4.3 static cutofftype GoSUM::CReduction::CutoffType ( ) [inline], [static]

Returns actual criteria type.

6.62.4.4 double GoSUM::CReduction::cutoffValue ( ) const [inline]

return cutoff value.

6.62.4.5 void GoSUM::CReduction::eraseNonSelectedVariables ( )

Reduces the model, i.e. deletes all input paramters and output states that are not selected.

6.62.4.6 void GoSUM::CReduction::evaluateMaximalSensitivities ( )

Evaluates maximal indices for all input parameters relative to selected output states.

6.62.4.7 void GoSUM::CReduction::initialize ( )

Initializes reducing.

6.62.4.8 bool GoSUM::CReduction::isSelectedInputParameter (int *_i*) const

Returns true if particular input parameter is selected, false otherwise.

6.62.4.9 bool GoSUM::CReduction::isSelectedOutputState (int *_o*) const

Returns true if particular output state is selected, false otherwise.

6.62.4.10 double GoSUM::CReduction::maximalSensitivity (int *_i*)

Returns maximal (relative to selected output states) sensitivity index for particular input parameter.

6.62.4.11 double GoSUM::CReduction::maximalSensitivity ( )

Returns maximal (relative to selected output states) sensitivity index.

6.62.4.12 GoSUM::CReduction::reductiontype GoSUM::CReduction::ReductionType (const std::string & *_stype*) [static]

Converts reduction type name (string) to reductiontype enumerator.

6.62.4.13 static reductiontype GoSUM::CReduction::ReductionType ( ) [inline], [static]

Returns actual reduction type.

6.62.4.14 void GoSUM::CReduction::selectInputParameters ( )

Cuts by actual cutoff criteria.

6.62.4.15 void GoSUM::CReduction::selectOutputs (const std::vector< std::string > & *_selOS*)

Selects output states named in the _selOS.

6.62.4.16 void GoSUM::CReduction::selectOutputState (int *_o*)

Selects output state for reduction criteria.

6.62.4.17 const ArrayXXd & GoSUM::CReduction::sensitivityIndex ( )

Returns actual sensitivitiy index.

6.62.4.18 template<class Archive > void GoSUM::CReduction::serialize (Archive & *ar,* const unsigned int *version*) [private]

6.62.4.19 void GoSUM::CReduction::setCutoffSize (int *_cutip*)

Sets cutoff size.

6.62.4.20 static void GoSUM::CReduction::SetCutoffType (enum cutofftype *_cuttype*) [inline], [static]

Sets reduction type.

6.62.4.21 void GoSUM::CReduction::setCutoffValue (double *_cutval*)

Sets cutoff value.

6.62.4.22 static void GoSUM::CReduction::SetReductionType (enum reductiontype *_redtype*) [inline], [static]

Sets reduction type.

6.62.4.23 void GoSUM::CReduction::setReductionType (enum reductiontype *_redtype*)

Sets reduction type.

6.62.5 Friends And Related Function Documentation

6.62.5.1 friend class boost::serialization::access [friend]

Boost serialization.

6.62.6 Member Data Documentation

6.62.6.1 int GoSUM::CReduction::cutip [private]

Holds size of the selected inputs.

6.62.6.2 int GoSUM::CReduction::cutos [private]

Holds size of the selected outputs.

6.62.6.3 enum **cutofftype** GoSUM::CReduction::cuttype [static]

Holds actual criteria type.

6.62.6.4 double GoSUM::CReduction::cutval [private]

Holds cutoff value.

6.62.6.5 **CAnalyticalModel**$*$ GoSUM::CReduction::pAM [private]

Points to the analytical model.

6.62.6.6 **CInputParameters**$*$ GoSUM::CReduction::pIP [private]

Points to input parameters.

6.62.6.7 **COutputStates**$*$ GoSUM::CReduction::pOS [private]

Points to output states.

6.62.6.8 **CSensitivityAnalysis**$*$ GoSUM::CReduction::pSA [private]

Points to the sensitivity analysis.

6.62.6.9 std::vector$<$ std::pair$<$double,bool$>$ $>$ GoSUM::CReduction::rankIP [private]

Holds pairs of input parameter appropriate maximal sensitivity indices (relative to selected output states), it sorted in descending order and appropraite selection status.

6.62.6.10 std::vector$<$bool$>$ GoSUM::CReduction::rankOS [private]

Holds pairs of output state names and appropriate selection status.

6.62.6.11 enum **reductiontype** GoSUM::CReduction::redtype [static]

Holds actual reduction type.

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

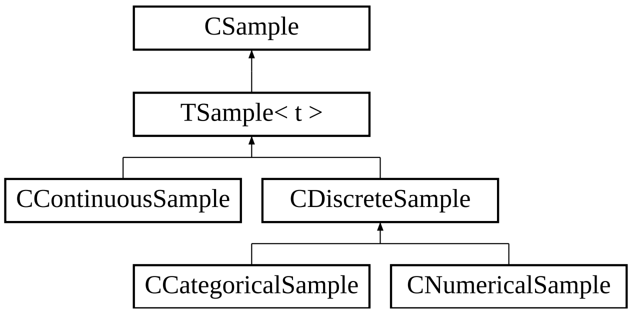
- C:/Development/core/Reduction.h
- C:/Development/core/Reduction.cpp

6.63 CSample Class Reference

Abstract class for all samples.

`#include <Sample.h>`

Inheritance diagram for CSample:



Public Member Functions

- CSample ()
- virtual ∼CSample ()
- CSample (const CSample &O)
- virtual void clear ()=0

  Clears object.
- virtual void setSampleSize (int _n)=0

  (Re)sizes the sample, all previous data is lost.
- virtual int sampleSize () const =0

  Returns sample size (number of data in the sample).
- virtual void setSampleValue (double _val, int _at)=0

  Sets particular sample data value.
- virtual void readSampleValue (std::ifstream &_ifs, int _at)=0

  Reads particular sample data from input file stream.
- virtual void writeSampleValue (std::ofstream &_ofs, int _at) const =0

  Writes particular sample data to output file stream.
- virtual void computeStatistics (int _n)=0

  Computes sample statistics, i.e. normalized histogram etc.
- virtual double variance () const =0

  Returns sample variance (i.e.empirical).
- virtual std::vector< int > select (double _left, double _right) const =0

  Returns vector of indices of sample values selected if they are in the interval [_left,_right].
- virtual void eraseSelected (const std::vector< int > &sel)=0

  Erases sample values on positions defiend by sel.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Static Protected Attributes

- static int maxdiscretesize = 11

Friends

- class boost::serialization::access

  Boost serialization.

6.63.1 Detailed Description

Abstract class for all samples.

6.63.2 Constructor & Destructor Documentation

6.63.2.1 CSample::CSample ( ) [inline]

6.63.2.2 virtual CSample::∼CSample ( ) [inline], [virtual]

6.63.2.3 CSample::CSample (const CSample & *O*) [inline]

6.63.3 Member Function Documentation

6.63.3.1 virtual void CSample::clear ( ) [pure virtual]

Clears object.

Implemented in TSample< t >.

6.63.3.2 virtual void CSample::computeStatistics (int *_n*) [pure virtual]

Computes sample statistics, i.e. normalized histogram etc.

Implemented in CContinuousSample, and CDiscreteSample.

6.63.3.3 virtual void CSample::eraseSelected (const std::vector< int > & *sel*) [pure virtual]

Erases sample values on positions defiend by sel.

Implemented in TSample< t >.

6.63.3.4 virtual void CSample::readSampleValue (std::ifstream & *_ifs,* int *_at*) [pure virtual]

Reads particular sample data from input file stream.

Implemented in CCategoricalSample, CNumericalSample, and TSample< t >.

6.63.3.5 virtual int CSample::sampleSize ( ) const [pure virtual]

Returns sample size (number of data in the sample).

Implemented in TSample< t >.

6.63.3.6 virtual std::vector<int> CSample::select (double *_left,* double *_right*) const [pure virtual]

Returns vector of indices of sample values selected if they are in the interval [_left,_right].

Implemented in TSample< t >.

6.63.3.7 template< class Archive > void CSample::serialize (Archive & *ar*, const unsigned int *version*) [inline], [protected]

Reimplemented in CContinuousSample, CDiscreteSample, and TSample< t >.

6.63.3.8 virtual void CSample::setSampleSize (int *_n*) [pure virtual]

(Re)sizes the sample, all previous data is lost.

Implemented in CCategoricalSample, CNumericalSample, and TSample< t >.

6.63.3.9 virtual void CSample::setSampleValue (double *_val*, int *_at*) [pure virtual]

Sets particular sample data value.

Implemented in TSample< t >.

6.63.3.10 virtual double CSample::variance ( ) const [pure virtual]

Returns sample variance (i.e.empirical).

Implemented in CCategoricalSample, CNumericalSample, CContinuousSample, and CDiscreteSample.

6.63.3.11 virtual void CSample::writeSampleValue (std::ofstream & *_ofs*, int *_at*) const [pure virtual]

Writes particular sample data to output file stream.

Implemented in CCategoricalSample, CNumericalSample, and TSample< t >.

6.63.4 Friends And Related Function Documentation

6.63.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.63.5 Member Data Documentation

6.63.5.1 int CSample::maxdiscretesize = 11 [static], [protected]

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

- C:/Development/core/Sample.h
- C:/Development/core/Sample.cpp

6.64 GoSUM::CScript Class Reference

Class for the GoSUM script format.

`#include <Script.h>`

Public Member Functions

- CScript ()
- virtual ∼CScript ()
- void read (GoSUM::CContainer ∗_pContainer, const std::string &_fileName)

    Reads script file and interprets all script commands.

Private Member Functions

- std::string line2Path (std::istringstream &_line)

    Returns path from the input line.
- void addVariable (std::istringstream &iscl)

    Tells project to add model variable.
- void addVariables (std::istringstream &iscl)

    Tells project to add model variables.
- void importVariables (std::istringstream &iscl)

    Tells project to import model variables.
- void setProjectPath (std::istringstream &iscl)
- void setProjectName (std::istringstream &iscl)
- void setProjectType (std::istringstream &iscl)
- void setOptimizationMethod (std::istringstream &iscl)
- void setCoreSize (std::istringstream &iscl)
- void setMatLabPath (std::istringstream &iscl)
- void setRNG (std::istringstream &iscl)
- void addInput (std::istringstream &iscl)
- void addOutput (std::istringstream &iscl)
- void addInputs (std::istringstream &iscl)
- void addOutputs (std::istringstream &iscl)
- void importInputs (std::istringstream &iscl)
- void importOutputs (std::istringstream &iscl)
- void setResampleType (std::istringstream &iscl)
- void setResampleSize (std::istringstream &iscl)
- void setVoronoiOptions (std::istringstream &iscl)
- void resampleInputs (std::istringstream &iscl)
- void setModelEvaluator (std::istringstream &iscl)
- void evaluateOutputs (std::istringstream &iscl)
- void exportInputSamples (std::istringstream &iscl)
- void exportOutputSamples (std::istringstream &iscl)
- void learnModel (std::istringstream &iscl)
- void importPredictionInputSamples (std::istringstream &iscl)
- void exportPredictionOutputSamples (std::istringstream &iscl)
- void predict (std::istringstream &iscl)
- void setSensitivityOptions (std::istringstream &iscl)
- void computeSensitivities (std::istringstream &iscl)
- void setReductionType (std::istringstream &iscl)
- void setReductionOutputs (std::istringstream &iscl)
- void setReductionCutoffSize (std::istringstream &iscl)
- void setReductionCutoffValue (std::istringstream &iscl)
- void reduce (std::istringstream &iscl)
- void setObjective (std::istringstream &iscl)
- void addOptimizationConstraint (std::istringstream &iscl)
- void setConstLowerBound (std::istringstream &iscl)
- void setLowerBound (std::istringstream &iscl)

- void setConstUpperBound (std::istringstream &iscl)
- void setUpperBound (std::istringstream &iscl)
- void setConstInitialValue (std::istringstream &iscl)
- void setInitialValue (std::istringstream &iscl)
- void setMadsMaxEvaluation (std::istringstream &iscl)
- void setMadsLHSearch (std::istringstream &iscl)
- void setMadsInitMeshSize (std::istringstream &iscl)
- void setMadsMinPollSize (std::istringstream &iscl)
- void minimize (std::istringstream &iscl)
- void maximize (std::istringstream &iscl)
- void save (std::istringstream &iscl)
- void load (std::istringstream &iscl)
- void saveXml (std::istringstream &iscl)
- void loadXml (std::istringstream &iscl)
- void saveTxt (std::istringstream &iscl)
- void loadTxt (std::istringstream &iscl)
- void exportDerivativeSensitivity (std::istringstream &iscl)
- void exportAverageDerivative (std::istringstream &iscl)
- void exportAbsoluteAverageDerivative (std::istringstream &iscl)
- void exportVarianceSensitivity (std::istringstream &iscl)
- void exportANOVA1 (std::istringstream &iscl)
- void exportOptimizationMethod (std::istringstream &iscl)
- void exportOptimizationHistory (std::istringstream &iscl)

Private Attributes

- vector< pair< std::string,
  paction > > cmds

  Vector of pairs: first is string of the admissible script command, second is pointer to action function.
- int noeql
- CContainer ∗ pContainer

  Pointer to GoSUM project container.
- void(CContainer::∗ padd)(const std::string &, CRandomVariable::distributiontype, double, double)

  Pointer to member function that tells project to add model variable.
- void(CContainer::∗ padds)(int, const std::string &, CRandomVariable::distributiontype, double, double)

  Pointer to member function that tells project to add model variables.
- void(CContainer::∗ pimport)(const std::string &_fname)

  Pointer to member function that tells project to import data from import file.

6.64.1 Detailed Description

Class for the GoSUM script format.

6.64.2 Constructor & Destructor Documentation

6.64.2.1 GoSUM::CScript::CScript ( )

6.64.2.2 virtual GoSUM::CScript::∼CScript ( ) [inline], [virtual]

6.64.3 Member Function Documentation

6.64.3.1 void GoSUM::CScript::addInput (std::istringstream & *iscl*) `[inline]`, `[private]`

Tells project to add one input parameter. Format of the related script command is:

add_input = nm tp a b

where **nm** is the input parameter name (must be unique), **tp** is the distribution type, and **a** and **b** are distribution parameters, for some types they must be omitted. More precisely, following distribution types, and related distribution parameters can be used:

- *constantdiscrete*, then **a** is the constant value of that random variable, **b** must be omitted,
- *uniformdiscrete*, then **a** and **b** are the lower and the upper boound of that random variable,
- *categorical*, then **a** and **b** must be omitted,
- *constantcontinuous*, then **a** is the constant value of that random variable, **b** must be omitted,
- *uniformcontinuous*, then **a** and **b** are the lower and the upper boound of that random variable,
- *gaussian*, then **a** is the mean and **b** is the standard deviation of the gaussian distribution,
- *exponential*, then **a** is the rate parameter of the exponential parameter, **b** must be omitted,
- *empiricalcontinuous*, then **a** and **b** must be omitted.

6.64.3.2 void GoSUM::CScript::addInputs (std::istringstream & *iscl*) `[inline]`, `[private]`

Tells project to add multiple input parameters. Format of the related script command is:

add_inputs = sz nm tp a b

where **sz** is the number of input parameters to be added, **nm** is the common part for the input parameters name (must be unique), **tp** is the distribution type, and **a** and **b** are distribution parameters, for some types they must be omitted. Multiple adding of input parameters is possible only for input parameters that have the same distribution, and their names are generated by adding a suffix to the common part of the name. For more details on distribution types and parameters, see description of **add_input** script command.

6.64.3.3 void GoSUM::CScript::addOptimizationConstraint (std::istringstream & *iscl*) `[private]`

Tells project to add an optimization constraint. Format of the related script command is:

add_optimization_constraint = gexpr

where **gexpr** is the analytical expression of the constraint.

6.64.3.4 void GoSUM::CScript::addOutput (std::istringstream & *iscl*) `[inline]`, `[private]`

Tells project to add one output state. Format of the related script command is:

add_output = nm tp a b

where **nm** is the output state name (must be unique), **tp** is the distribution type, and **a** and **b** are distribution parameters, for some types they must be omitted. For more details on distribution types and parameters, see description of **add_input** script command.

6.64.3.5 void GoSUM::CScript::addOutputs (std::istringstream & *iscl*) `[inline]`, `[private]`

Tells project to add multiple output states. Format of the related script command is:

add_outputs = sz nm tp a b

where **sz** is the number of output states to be added, **nm** is the common part for the output state name (must be unique), **tp** is the distribution type, and **a** and **b** are distribution parameters, for some types they must be omitted. Multiple adding of output states is possible only for output states that have the same distribution, and their names are generated by adding a suffix to the common part of the name. For more details, see description of **add_input** script command.

6.64.3.6 void GoSUM::CScript::addVariable (std::istringstream & *iscl*) [private]

Tells project to add model variable.

6.64.3.7 void GoSUM::CScript::addVariables (std::istringstream & *iscl*) [private]

Tells project to add model variables.

6.64.3.8 void GoSUM::CScript::computeSensitivities (std::istringstream & *iscl*) [private]

Tells project to compute sensitivities. Format of the related script command is:

compute_sensitivities

6.64.3.9 void GoSUM::CScript::evaluateOutputs (std::istringstream & *iscl*) [private]

Tells project to evaluate output states. Format of the related script command is:

evaluate_outputs

6.64.3.10 void GoSUM::CScript::exportAbsoluteAverageDerivative (std::istringstream & *iscl*) [private]

Tells project to export absolute average derivative. Format of the related script command is:

export_absolute_average_derivative = fn

where **fn** is the name of the export file.

6.64.3.11 void GoSUM::CScript::exportANOVA1 (std::istringstream & *iscl*) [private]

Tells project to export first order ANOVA. Format of the related script command is:

export_ANOVA1 = fn

where **fn** is the name of the export file.

6.64.3.12 void GoSUM::CScript::exportAverageDerivative (std::istringstream & *iscl*) [private]

Tells project to export average derivative. Format of the related script command is:

export_average_derivative = fn

where **fn** is the name of the export file.

6.64.3.13 void GoSUM::CScript::exportDerivativeSensitivity (std::istringstream & *iscl*) [private]

Tells project to export derivative sensitivities. Format of the related script command is:

export_derivative_sensitivity = fn

where **fn** is the name of the export file.

6.64.3.14 void GoSUM::CScript::exportInputSamples (std::istringstream & *iscl*) [private]

Tells project to export input samples. Format of the related script command is:

export_input_samples = fn

where **fn** is the name of the export file.

6.64.3.15 void GoSUM::CScript::exportOptimizationHistory (std::istringstream & *iscl*) [private]

Tells project to export optimization history. Format of the related script command is:

export_optimization_history = fn

where **fn** is the name of the export file.

6.64.3.16 void GoSUM::CScript::exportOptimizationMethod (std::istringstream & *iscl*) [private]

Tells project to export optimization method. Format of the related script command is:

export_optimization_method = fn

where **fn** is the name of the export file.

6.64.3.17 void GoSUM::CScript::exportOutputSamples (std::istringstream & *iscl*) [private]

Tells project to export output samples. Format of the related script command is:

export_output_samples = fn

where **fn** is the name of the export file.

6.64.3.18 void GoSUM::CScript::exportPredictionOutputSamples (std::istringstream & *iscl*) [private]

Tells project to export prediction output samples. Format of the related script command is:

export_prediction_output_samples = fn

where **fn** is the name of the export file.

6.64.3.19 void GoSUM::CScript::exportVarianceSensitivity (std::istringstream & *iscl*) [private]

Tells project to export variance sensitivities. Format of the related script command is:

export_variance_sensitivity = fn

where **fn** is the name of the export file.

6.64.3.20 void GoSUM::CScript::importInputs (std::istringstream & *iscl*) [inline], [private]

Tells project to import input parameters. Format of the related script command is:

import_inputs = fn

where **fn** is the name of the import file. Import file must have one of the following four formats. (1) In the case of **named theoretical variables format** each line must contain variable name, variable distribution type, and distribution parameters. (2) In the case of **theoretical variables format** each line must contain variable distribution type and distribution parameters. (3) In the case of **named empirical variables format** first line must begin with a # sign and must contain names of all imported variables. The rest of the file must contain sample data, with columns as variables, and rows as samples. (4) In the case of **empirical variables format** file must contain sample data, with columns as variables, and rows as samples. For more details on distribution types and distribution parameters see description of **add_input** script command. (5) In the case of **named declared empirical variables format** first line must begin with a # sign and must contain names of all imported variables, and second line must begin with a double # sign and must contain types of all imported variables. The rest of the file must contain sample data, with columns as variables, and rows as samples. (6) In the case of **declared empirical variables format** first line must begin with a double # sign and must contain types of all imported variables. The rest of the file must contain sample data, with columns as variables, and rows as samples. For more details on distribution types and distribution parameters see description of **add_input** script command.

6.64.3.21 void GoSUM::CScript::importOutputs (std::istringstream & *iscl*) [inline], [private]

Tells project to import output states. Format of the related script command is:

import_outputs = fn

where **fn** is the name of the import file. For the description of the import file format see cescrition of **import_inputs** command, format cases (3), (4), (5), and (6).

6.64.3.22 void GoSUM::CScript::importPredictionInputSamples (std::istringstream & *iscl*) [private]

Tells project to import prediction input samples. Format of the related script command is:

import_prediction_input_samples = fn

where **fn** is the name of the import file.

6.64.3.23 void GoSUM::CScript::importVariables (std::istringstream & *iscl*) [private]

Tells project to import model variables.

6.64.3.24 void GoSUM::CScript::learnModel (std::istringstream & *iscl*) [private]

Tells project to learn analytical model from the original model. Format of the related script command is:

learn_model

6.64.3.25 std::string GoSUM::CScript::line2Path (std::istringstream & *_line*) [private]

Returns path from the input line.

6.64.3.26 void GoSUM::CScript::load (std::istringstream & *iscl*) [private]

Tells project to load from binary format. Format of the related script command is:

load

6.64.3.27 void GoSUM::CScript::loadTxt (std::istringstream & *iscl*) [private]

Tells project to load from txt format. Format of the related script command is:

load_txt

6.64.3.28 void GoSUM::CScript::loadXml (std::istringstream & *iscl*) [private]

Tells project to load from xml format. Format of the related script command is:

load_xml

6.64.3.29 void GoSUM::CScript::maximize (std::istringstream & *iscl*) [private]

Tells project to find maximum of the previously defined optimization problem. Format of the related script command is:

maximize

6.64.3.30 void GoSUM::CScript::minimize (std::istringstream & *iscl*) [private]

Tells project to find minimum of the previously defined optimization problem. Format of the related script command is:

minimize

6.64.3.31 void GoSUM::CScript::predict (std::istringstream & *iscl*) [private]

Tells project to predict using analytical model. Format of the related script command is:

predict

6.64.3.32 void GoSUM::CScript::read (GoSUM::CContainer ∗ *_pContainer,* const std::string & *_fileName*)

Reads script file and interprets all script commands.

6.64.3.33 void GoSUM::CScript::reduce (std::istringstream & *iscl*) [private]

Tells project to reduce model. Format of the related script command is:

reduce

6.64.3.34 void GoSUM::CScript::resampleInputs (std::istringstream & *iscl*) [private]

Tells project to resample input parameters. Format of the related script command is:

resample_inputs

6.64.3.35 void GoSUM::CScript::save (std::istringstream & *iscl*) [private]

Tells project to save to binary format. Format of the related script command is:

save

6.64.3.36 void GoSUM::CScript::saveTxt (std::istringstream & *iscl*) [private]

Tells project to save to txt format. Format of the related script command is:

save_txt

6.64.3.37 void GoSUM::CScript::saveXml (std::istringstream & *iscl*) [private]

Tells project to save to xml format. Format of the related script command is:

save_xml

6.64.3.38 void GoSUM::CScript::setConstInitialValue (std::istringstream & *iscl*) [private]

Tells project to set constant initial value. Format of the related script command is:

set_const_upper_bound = x0

where **x0** is the same initial value for all decision variables.

6.64.3.39 void GoSUM::CScript::setConstLowerBound (std::istringstream & *iscl*) [private]

Tells project to set constant lower bounds. Format of the related script command is:

set_const_lower_bound = xl

where **xl** is the same lower bound value for all decision variables.

6.64.3.40 void GoSUM::CScript::setConstUpperBound (std::istringstream & *iscl*) [private]

Tells project to set constant upper bound. Format of the related script command is:

set_const_upper_bound = xu

where **xu** is the same upper bound value for all decision variables.

6.64.3.41 void GoSUM::CScript::setCoreSize (std::istringstream & *iscl*) [private]

Tells project to set core size. Format of the related script command is:

set_core_size = cs

where **cs** is the core size, i.e. number of cores to be used when multithreading is used in computations. The optimal value is one less than the number of computer cores.

6.64.3.42 void GoSUM::CScript::setInitialValue (std::istringstream & *iscl*) [private]

Tells project to set initial values for all decision variables. Format of the related script command is:

set_initial_value = x1_0 x2_0 ...

where **x1_0** , **x2_0** , etc. are initial values for decision variables.

6.64.3.43 void GoSUM::CScript::setLowerBound (std::istringstream & *iscl*) [private]

Tells project to set lower bounds for all decision variables. Format of the related script command is:

set_lower_bound = x1_L x2_L ...

where **x1_L** , **x2_L** , etc. are lower bounds for decision variables.

6.64.3.44 void GoSUM::CScript::setMadsInitMeshSize (std::istringstream & *iscl*) [private]

Tells project to set inital mesh size in MADS. Format of the related script command is:

set_mads_init_mesh_size = ims

where **ims** is the inital mesh size.

6.64.3.45 void GoSUM::CScript::setMadsLHSearch (std::istringstream & *iscl*) [private]

Tells project to set LH search parameters in MADS. Format of the related script command is:

set_mads_lh_search = lh0 lhi

where **lh0** is the inital LH value, and **lhi** is the LH iteration.

6.64.3.46 void GoSUM::CScript::setMadsMaxEvaluation (std::istringstream & *iscl*) [private]

Tells project to set maximal number of evaluations in MADS. Format of the related script command is:

set_mads_max_evaluation = maxeval

where **maxeval** is the maximal number of evaluations.

6.64.3.47 void GoSUM::CScript::setMadsMinPollSize (std::istringstream & *iscl*) [private]

Tells project to set minimal poll size in MADS. Format of the related script command is:

set_mads_min_poll_size = mps

where **mps** is the minimal poll size.

6.64.3.48 void GoSUM::CScript::setMatLabPath (std::istringstream & *iscl*) [private]

Tells project to set MatLab path. Format of the related script command is:

set_matlab_path = mp

where **mp** is the MatLab path, i.e. the path of the MATLAB.exe.

6.64.3.49 void GoSUM::CScript::setModelEvaluator (std::istringstream & *iscl*) [private]

Tells project to set model evaluator. Format of the related script command is:

set_model_evaluator = me exe

where **me** is on of the following model evaluator types: *exeascii*, *exemat*, *matlabshell*, *matlabengine*; and **exe** is the name of the executable.

6.64.3.50 void GoSUM::CScript::setObjective (std::istringstream & *iscl*) [private]

Tells project to set objective. Format of the related script command is:

set_objective = fexpr

where **fexpr** is the analytical expression of the objective function.

6.64.3.51 void GoSUM::CScript::setOptimizationMethod (std::istringstream & *iscl*) [private]

Tells project to set optimization method. Format of the related script command is:

set_optimization_method = om

where **om** is one of the following optimization methods: *mads*, *ga*.

6.64.3.52 void GoSUM::CScript::setProjectName (std::istringstream & *iscl*) [private]

Tells project to set project name. Format of the related script command is:

set_project_name = pn

where **pn** is the name of the project.

6.64.3.53 void GoSUM::CScript::setProjectPath (std::istringstream & *iscl*) [private]

Tells project to set project path. Format of the related script command is:

set_project_path = pp

where **pp** is the path which contains all the project related files, must end with a backslash.

6.64.3.54 void GoSUM::CScript::setProjectType (std::istringstream & *iscl*) [private]

Tells project to set project type. Format of the related script command is:

set_project_type = pt

where **pt** is one of the following project types: *samplegeneration*, *modelanalysis*, *dataanalysis*, *simpleopt*, *modelopt*, *learnedmodelopt*, *learneddataopt*.

6.64.3.55 void GoSUM::CScript::setReductionCutoffSize (std::istringstream & *iscl*) [private]

Tells project to set reduction cut. Format of the related script command is:

set_reduction_cutoff_size = c

where **c** is size of chosen top intputs.

6.64.3.56 void GoSUM::CScript::setReductionCutoffValue (std::istringstream & *iscl*) [private]

Tells project to set reduction cut value. Format of the related script command is:

set_reduction_cutoff_value = c

where **c** is the cutoff value for choosing top inputs.

6.64.3.57 void GoSUM::CScript::setReductionOutputs (std::istringstream & *iscl*) [private]

Tells project to set/choose outputs for the model reduction. Format of the related script command is:

set_reduction_outputs = n o1 o2 ...

where **rn** is size of chosen outputs, and **o1**, **o2**, etc. are names of the chosen outputs.

6.64.3.58 void GoSUM::CScript::setReductionType (std::istringstream & *iscl*) [private]

Tells project to set model reduction type. Format of the related script command is:

set_reduction_type = rt

where **rt** is one of the following model reduction types: *derivative*, *averagederivative*, *absoluteaveragederivative*, *variance*.

6.64.3.59 void GoSUM::CScript::setResampleSize (std::istringstream & *iscl*) [private]

Tells project to set resample size. Format of the related script command is:

set_resample_size = sz

where **sz** is the resampling size, i.e. number of the samples to be generated.

6.64.3.60 void GoSUM::CScript::setResampleType (std::istringstream & *iscl*) [private]

Tells project to set resample type. Format of the related script command is:

set_resample_type = rg

where **rg** is one of the following sample generator types: *dsample*, *montecarlo*, *cvoronoi*, *lcvoronoi*.

6.64.3.61 void GoSUM::CScript::setRNG (std::istringstream & *iscl*) [private]

Tells project to set random number generator (RNG) type. Format of the related script command is:

set_rng = rng

where **rng** is one of the following RNG types: *smallperiod* (10^8), *mediumperiod* (2 $*$ 10^18), *nonlinearcongruential*, *largeperiod* (3.138$*$10^57), *dsample* (default), *mads*.

6.64.3.62 void GoSUM::CScript::setSensitivityOptions (std::istringstream & *iscl*) [private]

Tells project to set sensitivity options. Format of the related script command is:

set_sensitivity_options = sz eps1 eps2 eps3

where **sz** is the resized sample size, **eps1** is the sensitivity error (default 0.005), **eps2** is the separability error (default 0.01), and **eps3** is the coupling error (default 0.01).

6.64.3.63 void GoSUM::CScript::setUpperBound (std::istringstream & *iscl*) [private]

Tells project to set upper bounds for all decision variables. Format of the related script command is:

set_upper_bound = x1_U x2_U ...

where **x1_U** , **x2_U** , etc. are upper bounds for decision variables.

6.64.3.64 void GoSUM::CScript::setVoronoiOptions (std::istringstream & *iscl*) [private]

Tells project to set Centralized Voronoi Tessellation (CVT) options. Format of the related script command is:

set_voronoi_options = maxiter q alpha2 beta2

where **maxiter** is maximal number of iterations in CVT, and **q**, **alpha2**, and **beta2** are CVT parameters.

6.64.4 Member Data Documentation

6.64.4.1 vector< pair<std::string,paction> > GoSUM::CScript::cmds [private]

Vector of pairs: first is string of the admissible script command, second is pointer to action function.

6.64.4.2 int GoSUM::CScript::noeql [private]

6.64.4.3 void(CContainer::$*$ GoSUM::CScript::padd)(const std::string &, CRandomVariable::distributiontype,double,double) [private]

Pointer to member function that tells project to add model variable.

6.64.4.4 void(CContainer::∗ GoSUM::CScript::padds)(int,const std::string &,CRandomVariable::distributiontype,double,double) [private]

Pointer to member function that tells project to add model variables.

6.64.4.5 CContainer∗ GoSUM::CScript::pContainer [private]

Pointer to GoSUM project container.

6.64.4.6 void(CContainer::∗ GoSUM::CScript::pimport)(const std::string &_fname) [private]

Pointer to member function that tells project to import data from import file.

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

- C:/Development/core/Script.h
- C:/Development/core/Script.cpp

6.65 GoSUM::CSensitivityAnalysis Class Reference

Class for sensitivity analyis of the model.

`#include <SensitivityAnalysis.h>`

Public Member Functions

- CSensitivityAnalysis (CInputParameters ∗_pIP, COutputStates ∗_pOS, CAnalyticalModel ∗_pAM)
- virtual ∼CSensitivityAnalysis ()
- void clear ()
- void setSensitivityOptions (int _RSsize, double _eps1, double _eps2, double _eps3)
- int resampleSize () const

  Returns resample size.
- void setResampleSize (int _RSsize)

  Sets resample size.
- double sensitivityError () const

  Returns sensitivity error.
- void setSensitivityError (double _eps1)

  Sets sensitivity error.
- double separabilityError () const

  Returns separability error.
- void setSeparabilityError (double _eps2)

  Sets separability error.
- double couplingError () const

  Returns coupling error.
- void setCouplingError (double _eps3)

  Sets coupling error.
- void prepare ()

  Prepares sensitivity analysis computation.
- void computeDerivativeSensitivities ()

  Computes derivative sensitivities.
- void computeVarianceSensitivities ()

Computes variance sensitivities.

- void computeVarianceSensitivities1 ()

  Computes variance sensitivities (Homma & Saltelli approach).
- void computeSensitivities ()

  Computes sensitivities.
- const ArrayXXd & derivativeSensitivity ()

  Returns derivative sensitivity (L2) for all output states (rows) over all input parameters (columns).
- const ArrayXXd & averageDerivative ()

  Returns average derivative for all output states (rows) over all input parameters (columns).
- const ArrayXXd & absoluteAverageDerivative ()

  Returns absolute average derivative (L1) for all output states (rows) over all input parameters (columns).
- const ArrayXXd & varianceSensitivity ()

  Returns variance sensitivity (L2) for all output states (rows) over all input parameters (columns).
- const ArrayXXd & firstOrderANOVA ()

  Returns first order ANOVA for all output states (rows) over all input parameters (columns).
- std::vector< std::pair< int,
  int > > secondOrderANOVAPairs ()

  Returns second order ANOVA pairs.
- ArrayXXd secondOrderANOVA (const std::vector< std::pair< int, int > > &a2L)
- bool emptyDerivativeSensitivity () const

  Returns second order ANOVA indices for given pairs.
- bool emptyAverageDerivativeSensitivity () const

  Returns true if average derivative is empty, false otherwise.
- bool emptyAbsoluteAverageDerivativeSensitivity () const

  Returns true if absolute average derivative (L1) is empty, false otherwise.
- bool emptyVarianceSensitivity () const

  Returns true if variance sensitivity (L2) is empty, false otherwise.
- bool emptyFirstOrderANOVA () const

  Returns true if 1st order ANOVA is empty, false otherwise.
- bool empty () const

  Returns true if all sentitivity indices are empty, false otherwise.
- int progressStepsSize () const

  Returns progress steps size.

Public Attributes

- boost::signal< void()> computingProgressed

  Signal for computing progress, emitted on each sensitivity index computed.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- CSensitivityAnalysis ()

Private Attributes

- CInputParameters ∗ pIP

  Points to input parameters.
- COutputStates ∗ pOS

  Points to output states.
- CAnalyticalModel ∗ pAM

  Points to the analytical model.
- int RSsize

  Resized sample size.
- double eps1

  Sensitivity error.
- double eps2

  Separability error.
- double eps3

  Coupling error.
- std::vector< ArrayXd > sample1
- std::vector< ArrayXd > sample2
- ArrayXXd y
- ArrayXd yvar
- ArrayXd ymu
- ArrayXXd si1der

  Holds derivative sensitivity (L2) for all output states (rows) over all input parameters (columns).
- ArrayXXd ader

  Holds average derivative for all output states (rows) over all input parameters (columns).
- ArrayXXd aader

  Holds absolute average derivative (L1) for all output states (rows) over all input parameters (columns).
- ArrayXXd siT

  Holds variance sensitivity (L2) for all output states (rows) over all input parameters (columns).
- ArrayXXd si1

  Holds first order ANOVA sensitivity for all output states (rows) over all input parameters (columns).
- std::vector< std::vector
  < std::pair< std::pair< int,
  int >, double > > > si2

  Holds second order ANOVA sensitivity for all output states over all input parameter pairs.

Friends

- class boost::serialization::access

6.65.1 Detailed Description

Class for sensitivity analyis of the model.

6.65.2 Constructor & Destructor Documentation

6.65.2.1 GoSUM::CSensitivityAnalysis::CSensitivityAnalysis ( ) `[inline]`, `[private]`

6.65.2.2 GoSUM::CSensitivityAnalysis::CSensitivityAnalysis (CInputParameters ∗ *_pIP*, COutputStates ∗ *_pOS*, CAnalyticalModel ∗ *_pAM*) `[inline]`

6.65.2.3 virtual GoSUM::CSensitivityAnalysis::∼CSensitivityAnalysis ( ) `[inline], [virtual]`

6.65.3 Member Function Documentation

6.65.3.1 const ArrayXXd& GoSUM::CSensitivityAnalysis::absoluteAverageDerivative ( ) `[inline]`

Returns absolute average derivative (L1) for all output states (rows) over all input parameters (columns).

6.65.3.2 const ArrayXXd& GoSUM::CSensitivityAnalysis::averageDerivative ( ) `[inline]`

Returns average derivative for all output states (rows) over all input parameters (columns).

6.65.3.3 void GoSUM::CSensitivityAnalysis::clear ( ) `[inline]`

6.65.3.4 void GoSUM::CSensitivityAnalysis::computeDerivativeSensitivities ( )

Computes derivative sensitivities.

6.65.3.5 void GoSUM::CSensitivityAnalysis::computeSensitivities ( )

Computes sensitivities.

6.65.3.6 void GoSUM::CSensitivityAnalysis::computeVarianceSensitivities ( )

Computes variance sensitivities.

6.65.3.7 void GoSUM::CSensitivityAnalysis::computeVarianceSensitivities1 ( )

Computes variance sensitivities (Homma & Saltelli approach).

6.65.3.8 double GoSUM::CSensitivityAnalysis::couplingError ( ) const `[inline]`

Returns coupling error.

6.65.3.9 const ArrayXXd& GoSUM::CSensitivityAnalysis::derivativeSensitivity ( ) `[inline]`

Returns derivative sensitivity (L2) for all output states (rows) over all input parameters (columns).

6.65.3.10 bool GoSUM::CSensitivityAnalysis::empty ( ) const `[inline]`

Returns true if all sentitivity indices are empty, false otherwise.

6.65.3.11 bool GoSUM::CSensitivityAnalysis::emptyAbsoluteAverageDerivativeSensitivity ( ) const `[inline]`

Returns true if absolute average derivative (L1) is empty, false otherwise.

6.65.3.12 bool GoSUM::CSensitivityAnalysis::emptyAverageDerivativeSensitivity ( ) const `[inline]`

Returns true if average derivative is empty, false otherwise.

6.65.3.13 bool GoSUM::CSensitivityAnalysis::emptyDerivativeSensitivity ( ) const [inline]

Returns second order ANOVA indices for given pairs.

Returns true if derivative sentitivity (L2) is empty, false otherwise.

6.65.3.14 bool GoSUM::CSensitivityAnalysis::emptyFirstOrderANOVA ( ) const [inline]

Returns true if 1st order ANOVA is empty, false otherwise.

6.65.3.15 bool GoSUM::CSensitivityAnalysis::emptyVarianceSensitivity ( ) const [inline]

Returns true if variance sensitivity (L2) is empty, false otherwise.

6.65.3.16 const ArrayXXd& GoSUM::CSensitivityAnalysis::firstOrderANOVA ( ) [inline]

Returns first order ANOVA for all output states (rows) over all input parameters (columns).

6.65.3.17 void GoSUM::CSensitivityAnalysis::prepare ( )

Prepares sensitivity analysis computation.

6.65.3.18 int GoSUM::CSensitivityAnalysis::progressStepsSize ( ) const [inline]

Returns progress steps size.

6.65.3.19 int GoSUM::CSensitivityAnalysis::resampleSize ( ) const [inline]

Returns resample size.

6.65.3.20 ArrayXXd GoSUM::CSensitivityAnalysis::secondOrderANOVA (const std::vector< std::pair< int, int > > & *a2L*)

6.65.3.21 std::vector< std::pair< int, int > > GoSUM::CSensitivityAnalysis::secondOrderANOVAPairs ( )

Returns second order ANOVA pairs.

6.65.3.22 double GoSUM::CSensitivityAnalysis::sensitivityError ( ) const [inline]

Returns sensitivity error.

6.65.3.23 double GoSUM::CSensitivityAnalysis::separabilityError ( ) const [inline]

Returns separability error.

6.65.3.24 template<class Archive > void GoSUM::CSensitivityAnalysis::serialize (Archive & *ar,* const unsigned int *version*) [private]

6.65.3.25 void GoSUM::CSensitivityAnalysis::setCouplingError (double *_eps3*) [inline]

Sets coupling error.

6.65.3.26 void GoSUM::CSensitivityAnalysis::setResampleSize (int _RSsize) [inline]

Sets resample size.

6.65.3.27 void GoSUM::CSensitivityAnalysis::setSensitivityError (double _eps1) [inline]

Sets sensitivity error.

6.65.3.28 void GoSUM::CSensitivityAnalysis::setSensitivityOptions (int _RSsize, double _eps1, double _eps2, double _eps3) [inline]

Parameters

_eps3	Sets options for sensitivity analysis.

6.65.3.29 void GoSUM::CSensitivityAnalysis::setSeparabilityError (double _eps2) [inline]

Sets separability error.

6.65.3.30 const ArrayXXd& GoSUM::CSensitivityAnalysis::varianceSensitivity ( ) [inline]

Returns variance sensitivity (L2) for all output states (rows) over all input parameters (columns).

6.65.4 Friends And Related Function Documentation

6.65.4.1 friend class boost::serialization::access [friend]

6.65.5 Member Data Documentation

6.65.5.1 ArrayXXd GoSUM::CSensitivityAnalysis::aader [private]

Holds absolute average derivative (L1) for all output states (rows) over all input parameters (columns).

6.65.5.2 ArrayXXd GoSUM::CSensitivityAnalysis::ader [private]

Holds average derivative for all output states (rows) over all input parameters (columns).

6.65.5.3 boost::signal<void()> GoSUM::CSensitivityAnalysis::computingProgressed

Signal for computing progress, emitted on each sensitivity index computed.

6.65.5.4 double GoSUM::CSensitivityAnalysis::eps1 [private]

Sensitivity error.

6.65.5.5 double GoSUM::CSensitivityAnalysis::eps2 [private]

Separability error.

6.65.5.6 double GoSUM::CSensitivityAnalysis::eps3 [private]

Coupling error.

6.65.5.7 CAnalyticalModel∗ GoSUM::CSensitivityAnalysis::pAM [private]

Points to the analytical model.

6.65.5.8 CInputParameters∗ GoSUM::CSensitivityAnalysis::pIP [private]

Points to input parameters.

6.65.5.9 COutputStates∗ GoSUM::CSensitivityAnalysis::pOS [private]

Points to output states.

6.65.5.10 int GoSUM::CSensitivityAnalysis::RSsize [private]

Resized sample size.

6.65.5.11 std::vector<ArrayXd> GoSUM::CSensitivityAnalysis::sample1 [private]

6.65.5.12 std::vector<ArrayXd> GoSUM::CSensitivityAnalysis::sample2 [private]

6.65.5.13 ArrayXXd GoSUM::CSensitivityAnalysis::si1 [private]

Holds first order ANOVA sensitivity for all output states (rows) over all input parameters (columns).

6.65.5.14 ArrayXXd GoSUM::CSensitivityAnalysis::si1der [private]

Holds derivative sensitivity (L2) for all output states (rows) over all input parameters (columns).

6.65.5.15 std::vector<std::vector<std::pair<std::pair<int,int>,double> > > GoSUM::CSensitivityAnalysis::si2 [private]

Holds second order ANOVA sensitivity for all output states over all input parameter pairs.

6.65.5.16 ArrayXXd GoSUM::CSensitivityAnalysis::siT [private]

Holds variance sensitivity (L2) for all output states (rows) over all input parameters (columns).

6.65.5.17 ArrayXXd GoSUM::CSensitivityAnalysis::y [private]

6.65.5.18 ArrayXd GoSUM::CSensitivityAnalysis::ymu [private]

6.65.5.19 ArrayXd GoSUM::CSensitivityAnalysis::yvar [private]

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

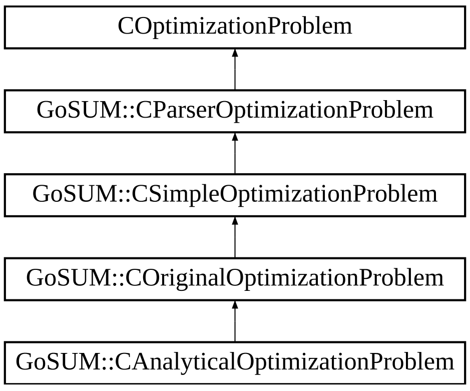
- C:/Development/core/SensitivityAnalysis.h
- C:/Development/core/SensitivityAnalysis.cpp

6.66 GoSUM::CSimpleOptimizationProblem Class Reference

Class for the optimization problem based only on GoSUM input parameters.

`#include <ParserOptimizationProblem.h>`

Inheritance diagram for GoSUM::CSimpleOptimizationProblem:


COptimizationProblem
GoSUM::CParserOptimizationProblem
GoSUM::CSimpleOptimizationProblem
GoSUM::COriginalOptimizationProblem
GoSUM::CAnalyticalOptimizationProblem

Public Member Functions

- CSimpleOptimizationProblem (CInputParameters ∗_pIP)
- virtual ∼CSimpleOptimizationProblem ()
- virtual void clear ()

  Clears all.
- virtual void clearHistory ()

  Clears results.
- int findConnectedTo (CModelVariable ∗_pip) const

  Finds optimization variable connected to a particular input parameter.
- const CModelOptimizationVariable & variable (int _at) const

  Returns paticular optimization variable.
- CModelOptimizationVariable & variable (int _at)

  Returns paticular optimization variable.
- std::string variableName (int _at)

  Returns name of the particular optimization variable.
- virtual bool isFeasible (const ArrayXd &_ip)

  Returns true if model variables is admissible, false otherwise.
- virtual void openOptimization ()
- virtual void closeOptimization ()

  Opens, i.e. prepares optimization.
- virtual bool evaluate (const ArrayXd &_hp, ArrayXd &_ep)

  Closes optimization, i.e. closes what was opened in openOptimization.
- ArrayXd inputPoint2ModelPoint (const ArrayXd &_ip)

  Converts input parameter point to model point.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- CSimpleOptimizationProblem ()
- virtual void setVariableNames ()

  Sets variable names for the parser.

Static Protected Member Functions

- static bool isModelVariable (const COptimizationVariable &_aOV)

  Used in member function Find.

Protected Attributes

- CInputParameters ∗ pIP

  Points to input parameters.
- std::vector< int > ovind
- std::vector< int > uvind

  Vectors of indices of optimization variables (ovind) and uncertain variables (uvind) among input parameters.
- std::vector< ArrayXd > samples

Static Protected Attributes

- static CModelVariable ∗ pipToFind = NULL

  Used in member function Find.

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.66.1 Detailed Description

Class for the optimization problem based only on GoSUM input parameters.

6.66.2 Constructor & Destructor Documentation

6.66.2.1 GoSUM::CSimpleOptimizationProblem::CSimpleOptimizationProblem ( ) `[inline], [protected]`

6.66.2.2 GoSUM::CSimpleOptimizationProblem::CSimpleOptimizationProblem (**CInputParameters** ∗ ***_pIP***) `[inline]`

6.66.2.3 virtual GoSUM::CSimpleOptimizationProblem::∼CSimpleOptimizationProblem ( ) `[inline], [virtual]`

6.66.3 Member Function Documentation

6.66.3.1 virtual void GoSUM::CSimpleOptimizationProblem::clear ( ) `[inline], [virtual]`

Clears all.

Reimplemented from COptimizationProblem.

6.66.3.2 virtual void GoSUM::CSimpleOptimizationProblem::clearHistory ( ) `[inline], [virtual]`

Clears results.

Reimplemented from COptimizationProblem.

6.66.3.3 void GoSUM::CSimpleOptimizationProblem::closeOptimization ( ) [virtual]

Opens, i.e. prepares optimization.

Reimplemented from GoSUM::CParserOptimizationProblem.

Reimplemented in GoSUM::COriginalOptimizationProblem.

6.66.3.4 bool GoSUM::CSimpleOptimizationProblem::evaluate (const ArrayXd & *_hp,* ArrayXd & *_ep*) [virtual]

Closes optimization, i.e. closes what was opened in openOptimization.

Evaluates objective and all constraints from optimization variables values and returns true if it is feasible, false otherwise.

Reimplemented from COptimizationProblem.

6.66.3.5 int GoSUM::CSimpleOptimizationProblem::findConnectedTo (CModelVariable * *_pip*) const

Finds optimization variable connected to a particular input parameter.

6.66.3.6 ArrayXd GoSUM::CSimpleOptimizationProblem::inputPoint2ModelPoint (const ArrayXd & *_ip*) [inline]

Converts input parameter point to model point.

Reimplemented in GoSUM::CAnalyticalOptimizationProblem, and GoSUM::COriginalOptimizationProblem.

6.66.3.7 virtual bool GoSUM::CSimpleOptimizationProblem::isFeasible (const ArrayXd & *_ip*) [inline], [virtual]

Returns true if model variables is admissible, false otherwise.

Reimplemented from COptimizationProblem.

6.66.3.8 static bool GoSUM::CSimpleOptimizationProblem::isModelVariable (const COptimizationVariable & *_aOV*) [inline], [static], [protected]

Used in member function Find.

6.66.3.9 void GoSUM::CSimpleOptimizationProblem::openOptimization ( ) [virtual]

Reimplemented from GoSUM::CParserOptimizationProblem.

Reimplemented in GoSUM::COriginalOptimizationProblem.

6.66.3.10 template<class Archive > void GoSUM::CSimpleOptimizationProblem::serialize (Archive & *ar,* const unsigned int *version*) [protected]

Reimplemented from GoSUM::CParserOptimizationProblem.

Reimplemented in GoSUM::CAnalyticalOptimizationProblem, and GoSUM::COriginalOptimizationProblem.

6.66.3.11 void GoSUM::CSimpleOptimizationProblem::setVariableNames ( ) [protected], [virtual]

Sets variable names for the parser.

Implements GoSUM::CParserOptimizationProblem.

Reimplemented in GoSUM::COriginalOptimizationProblem.

6.66.3.12 const CModelOptimizationVariable& GoSUM::CSimpleOptimizationProblem::variable (int _at) const [inline]

Returns paticular optimization variable.

6.66.3.13 CModelOptimizationVariable& GoSUM::CSimpleOptimizationProblem::variable (int _at) [inline]

Returns paticular optimization variable.

6.66.3.14 std::string GoSUM::CSimpleOptimizationProblem::variableName (int _at) [inline]

Returns name of the particular optimization variable.

6.66.4 Friends And Related Function Documentation

6.66.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.66.5 Member Data Documentation

6.66.5.1 std::vector<int> GoSUM::CSimpleOptimizationProblem::ovind [protected]

6.66.5.2 CInputParameters* GoSUM::CSimpleOptimizationProblem::pIP [protected]

Points to input parameters.

6.66.5.3 GoSUM::CModelVariable * GoSUM::CSimpleOptimizationProblem::pipToFind = NULL [static], [protected]

Used in member function Find.

6.66.5.4 std::vector<ArrayXd> GoSUM::CSimpleOptimizationProblem::samples [protected]

Samples for the uncertain varibles.

6.66.5.5 std::vector<int> GoSUM::CSimpleOptimizationProblem::uvind [protected]

Vectors of indices of optimization variables (ovind) and uncertain variables (uvind) among input parameters.

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

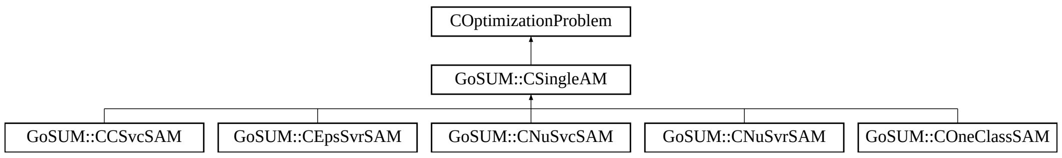
- C:/Development/core/ParserOptimizationProblem.h
- C:/Development/core/ParserOptimizationProblem.cpp

6.67 GoSUM::CSingleAM Class Reference

Base class for the analyitical model for single output state, interface between analytical model and SVM.

`#include <AnalyticalModel.h>`

Inheritance diagram for GoSUM::CSingleAM:



Public Member Functions

- CSingleAM ()
- virtual ∼CSingleAM ()
- void learn (int _osi, CMADS &_mads, std::ostream &_out=std::cout)

  Learns SVM models for all output states.
- virtual int constraintsSize () const

  Returns size of the constraints.
- virtual double constraint (const ArrayXd &mv, int _at)

  Evaluates particular constraint value from model variables values.
- virtual ArrayXd modelVariables (const ArrayXd &x) const

  Returns model variables values from optimization variables values.
- virtual double objective (const ArrayXd &ov)

  Evaluates objective function value from optimization variables values.
- virtual void openOptimization ()

  Opens optmization.
- virtual void optimizationPoint2SVMParam (const ArrayXd &ov)

  Converts optimization point to SVM parameters.
- double f (const ArrayXd &x) const

  Returns value of the output state according to the single output state analytical model.
- ArrayXd df (const ArrayXd &x) const

  Returns gradient of the output state according to the single output state the analytical model.

Static Public Member Functions

- static GoSUM::CSingleAM ∗ New (const CAnalyticalModel ∗_pAM)

  Returns new SingleAM of type defined in _pAM.
- static void OpenSVM (CInputParameters ∗_pIP, COutputStates ∗_pOS)

  Opens SVM learning (sets prob and xspace).
- static void CloseSVM ()

  Closes SVM learning.
- static void SetMaximalLearningSize (int _maxlearnsize)

  Sets maximal (sample) size used in learning.
- static int MaximalLearningSize ()

  Returns maximal (sample) size used in learning.
- static void SetLearningFraction (int _learnfrac)

  Sets (sample) fraction used in learning.
- static int LearningFraction ()

  Returns (sample) fraction used in learning.

Public Attributes

- boost::signal< void()> learningProgressed

  Signal for learning progress, emitted on every objective evaluation.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)
- double rbfKernel (const ArrayXd &x, int j) const

  Returns RBF kernel for jth support vector.

Protected Attributes

- struct svm_parameter param

  SVM format specific.
- struct svm_model ∗ model

  SVM format specific.
- int osi

  Index of the related output state.
- double gamma
- double C
- double p
- double nu

  SVM exponent constant in the RBF kernel case.
- double coef0

  SVM free coeficient in the polynomial kernel case.
- int degree

  SVM degree in the polynomial kernel case.
- int Nsvm

  SVM number of support vectors.
- ArrayXd coeff

  SVM coefficients.
- std::vector< ArrayXd > Xsv

Static Protected Attributes

- static CInputParameters ∗ pIP = NULL

  Points to input parameters.
- static COutputStates ∗ pOS = NULL

  Points to output states.
- static ArrayXi perm

  Permutation of sample indices.
- static struct svm_problem prob

  SVM format specific.
- static std::vector< struct
  svm_node > xspace

  SVM format specific.
- static int maxlearnsize = 1000
- static double learnfrac = 0.05

Friends

- class boost::serialization::access

  Boost serialization.

6.67.1 Detailed Description

Base class for the analyitical model for single output state, interface between analytical model and SVM.

6.67.2 Constructor & Destructor Documentation

6.67.2.1 GoSUM::CSingleAM::CSingleAM ( ) `[inline]`

6.67.2.2 virtual GoSUM::CSingleAM::∼CSingleAM ( ) `[inline], [virtual]`

6.67.3 Member Function Documentation

6.67.3.1 void GoSUM::CSingleAM::CloseSVM ( ) `[static]`

Closes SVM learning.

6.67.3.2 virtual double GoSUM::CSingleAM::constraint (const ArrayXd & *mv,* int *_at*) `[inline], [virtual]`

Evaluates particular constraint value from model variables values.

Implements COptimizationProblem.

6.67.3.3 virtual int GoSUM::CSingleAM::constraintsSize ( ) const `[inline], [virtual]`

Returns size of the constraints.

Implements COptimizationProblem.

6.67.3.4 ArrayXd GoSUM::CSingleAM::df (const ArrayXd & *x*) const

Returns gradient of the output state according to the single output state the analytical model.

6.67.3.5 double GoSUM::CSingleAM::f (const ArrayXd & *x*) const

Returns value of the output state according to the single output state analytical model.

6.67.3.6 void GoSUM::CSingleAM::learn (int *_osi,* CMADS & *_mads,* std::ostream & *_out* = `std::cout`)

Learns SVM models for all output states.

6.67.3.7 static int GoSUM::CSingleAM::LearningFraction ( ) `[inline], [static]`

Returns (sample) fraction used in learning.

6.67.3.8 static int GoSUM::CSingleAM::MaximalLearningSize ( ) `[inline], [static]`

Returns maximal (sample) size used in learning.

6.67.3.9 virtual ArrayXd GoSUM::CSingleAM::modelVariables (const ArrayXd & *x*) const `[inline], [virtual]`

Returns model variables values from optimization variables values.

6.67.3.10 GoSUM::CSingleAM ∗ GoSUM::CSingleAM::New (const CAnalyticalModel ∗ *_pAM*) [static]

Returns new SingleAM of type defined in _pAM.

6.67.3.11 double GoSUM::CSingleAM::objective (const ArrayXd & *ov*) [virtual]

Evaluates objective function value from optimization variables values.

Implements COptimizationProblem.

6.67.3.12 void GoSUM::CSingleAM::openOptimization ( ) [virtual]

Opens optmization.

Reimplemented from COptimizationProblem.

Reimplemented in GoSUM::CNuSvrSAM, and GoSUM::CEpsSvrSAM.

6.67.3.13 void GoSUM::CSingleAM::OpenSVM (CInputParameters ∗ *_pIP*, COutputStates ∗ *_pOS*) [static]

Opens SVM learning (sets prob and xspace).

6.67.3.14 virtual void GoSUM::CSingleAM::optimizationPoint2SVMParam (const ArrayXd & *ov*) [inline], [virtual]

Converts optimization point to SVM parameters.

Reimplemented in GoSUM::CNuSvrSAM, and GoSUM::CEpsSvrSAM.

6.67.3.15 double GoSUM::CSingleAM::rbfKernel (const ArrayXd & *x*, int *j*) const [inline], [protected]

Returns RBF kernel for jth support vector.

6.67.3.16 template<class Archive > void GoSUM::CSingleAM::serialize (Archive & *ar*, const unsigned int *version*) [protected]

Reimplemented from COptimizationProblem.

Reimplemented in GoSUM::CNuSvrSAM, GoSUM::CEpsSvrSAM, GoSUM::COneClassSAM, GoSUM::CNuSvcSAM, and GoSUM::CCSvcSAM.

6.67.3.17 static void GoSUM::CSingleAM::SetLearningFraction (int *_learnfrac*) [inline], [static]

Sets (sample) fraction used in learning.

6.67.3.18 static void GoSUM::CSingleAM::SetMaximalLearningSize (int *_maxlearnsize*) [inline], [static]

Sets maximal (sample) size used in learning.

6.67.4 Friends And Related Function Documentation

6.67.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.67.5 Member Data Documentation

6.67.5.1 double GoSUM::CSingleAM::C [protected]

6.67.5.2 double GoSUM::CSingleAM::coef0 [protected]

SVM free coeficient in the polynomial kernel case.

6.67.5.3 ArrayXd GoSUM::CSingleAM::coeff [protected]

SVM coefficients.

6.67.5.4 int GoSUM::CSingleAM::degree [protected]

SVM degree in the polynomial kernel case.

6.67.5.5 double GoSUM::CSingleAM::gamma [protected]

6.67.5.6 double GoSUM::CSingleAM::learnfrac = 0.05 [static], [protected]

6.67.5.7 boost::signal<void()> GoSUM::CSingleAM::learningProgressed

Signal for learning progress, emitted on every objective evaluation.

6.67.5.8 int GoSUM::CSingleAM::maxlearnsize = 1000 [static], [protected]

6.67.5.9 struct svm_model* GoSUM::CSingleAM::model [protected]

SVM format specific.

6.67.5.10 int GoSUM::CSingleAM::Nsvm [protected]

SVM number of support vectors.

6.67.5.11 double GoSUM::CSingleAM::nu [protected]

SVM exponent constant in the RBF kernel case.

6.67.5.12 int GoSUM::CSingleAM::osi [protected]

Index of the related output state.

6.67.5.13 double GoSUM::CSingleAM::p [protected]

6.67.5.14 struct svm_parameter GoSUM::CSingleAM::param [protected]

SVM format specific.

6.67.5.15 ArrayXi GoSUM::CSingleAM::perm [static], [protected]

Permutation of sample indices.

6.67.5.16 GoSUM::CInputParameters ∗ GoSUM::CSingleAM::pIP = NULL [static], [protected]

Points to input parameters.

6.67.5.17 GoSUM::COutputStates ∗ GoSUM::CSingleAM::pOS = NULL [static], [protected]

Points to output states.

6.67.5.18 struct svm_problem GoSUM::CSingleAM::prob [static], [protected]

SVM format specific.

6.67.5.19 std::vector< struct svm_node > GoSUM::CSingleAM::xspace [static], [protected]

SVM format specific.

6.67.5.20 std::vector<ArrayXd> GoSUM::CSingleAM::Xsv [protected]

SVM support vectors.

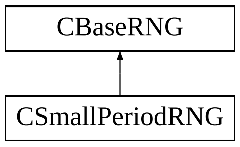
The documentation for this class was generated from the following files:

- C:/Development/core/AnalyticalModel.h
- C:/Development/core/AnalyticalModel.cpp

6.68 CSmallPeriodRNG Class Reference

```
#include <RandomGenerators.h>
```

Inheritance diagram for CSmallPeriodRNG:



Public Member Functions

- CSmallPeriodRNG ()
- CSmallPeriodRNG (unsigned int s)
- virtual ∼CSmallPeriodRNG ()
- virtual void setSeed (unsigned int s)

  Sets seed of the RNG.
- virtual unsigned int rndi ()

  Returns randomly generated unsigned int.
- virtual double rnd ()

  Returns randomly generated double between 0 and 1.

Static Private Attributes

- static long iy1 = 0

  Paramters of the small period RNG.
- static long iv1 [NTAB]

  Paramters of the small period RNG.
- static long idum1 = 0

  Paramters of the small period RNG.

6.68.1 Constructor & Destructor Documentation

6.68.1.1 CSmallPeriodRNG::CSmallPeriodRNG ( ) `[inline]`

6.68.1.2 CSmallPeriodRNG::CSmallPeriodRNG (unsigned int *s*) `[inline]`

6.68.1.3 virtual CSmallPeriodRNG::∼CSmallPeriodRNG ( ) `[inline], [virtual]`

6.68.2 Member Function Documentation

6.68.2.1 double CSmallPeriodRNG::rnd ( ) `[virtual]`

Returns randomly generated double between 0 and 1.

Implements CBaseRNG.

6.68.2.2 virtual unsigned int CSmallPeriodRNG::rndi ( ) `[inline], [virtual]`

Returns randomly generated unsigned int.

Implements CBaseRNG.

6.68.2.3 void CSmallPeriodRNG::setSeed (unsigned int *s*) `[virtual]`

Sets seed of the RNG.

Implements CBaseRNG.

6.68.3 Member Data Documentation

6.68.3.1 long CSmallPeriodRNG::idum1 = 0 `[static], [private]`

Paramters of the small period RNG.

6.68.3.2 long CSmallPeriodRNG::iv1 `[static], [private]`

Paramters of the small period RNG.

6.68.3.3 long CSmallPeriodRNG::iy1 = 0 `[static], [private]`

Paramters of the small period RNG.

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

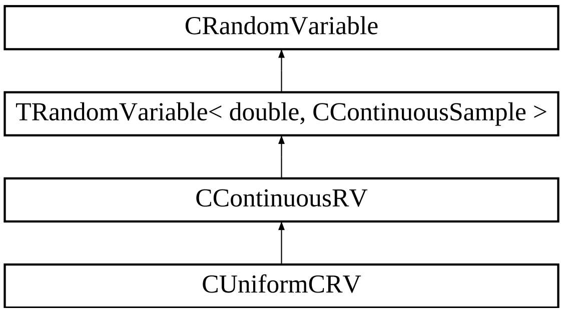
- C:/Development/core/RandomGenerators.h
- C:/Development/core/RandomGenerators.cpp

6.69 CUniformCRV Class Reference

Class for uniform continuous random variables derived from continuous random variables.

`#include <RandomVariable.h>`

Inheritance diagram for CUniformCRV:



Public Member Functions

- CUniformCRV ()
- virtual ∼CUniformCRV ()
- CUniformCRV (const CUniformCRV &O)
- virtual void setDistribution (double _a, double _b)

  Set distribution parameters.
- virtual void setDistribution (const CContinuousSample &_aS)

  Set distribution parameters from sample empirical parameters.
- virtual double probability (double _x) const

  Function that returns PDF.
- virtual double cumulative (double _x) const

  Function that returns CDF.
- virtual double minValue () const

  Returns minimal value of the random variable.
- virtual double maxValue () const

  Returns maximal value of the random variable.
- virtual double expectedValue () const

  Returns expected value of the random variable.
- virtual distributiontype distributionType () const

  Returns enum type of the random variable distribution.
- virtual std::string distributionName () const

  Returns name of the random variable distribution.
- virtual ArrayXd exportDomain () const

  Exports domain of the random variable.
- double lowerBound () const

  Returns lower bound of the uniform radnom variable.
- double upperBound () const

  Returns upper bound of the uniform radnom variable.
- void setLowerBound (double _a)

  Sets lower bound of the uniform radnom variable.
- void setUpperBound (double _b)

  Sets upper bound of the uniform radnom variable.
- virtual double variance () const

  Returns variance of the random variable.

Protected Member Functions

- virtual double doQuantile (double _p) const

  Quantile, formula implementation.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- double a
- double b
- double d

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.69.1 Detailed Description

Class for uniform continuous random variables derived from continuous random variables.

6.69.2 Constructor & Destructor Documentation

6.69.2.1 CUniformCRV::CUniformCRV ( ) `[inline]`

6.69.2.2 virtual CUniformCRV::∼CUniformCRV ( ) `[inline], [virtual]`

6.69.2.3 CUniformCRV::CUniformCRV (const CUniformCRV & *O*) `[inline]`

6.69.3 Member Function Documentation

6.69.3.1 virtual double CUniformCRV::cumulative (double *_x*) const `[inline], [virtual]`

Function that returns CDF.

6.69.3.2 virtual std::string CUniformCRV::distributionName ( ) const `[inline], [virtual]`

Returns name of the random variable distribution.

Implements CRandomVariable.

6.69.3.3 virtual distributiontype CUniformCRV::distributionType ( ) const `[inline], [virtual]`

Returns enum type of the random variable distribution.

Implements CRandomVariable.

6.69.3.4 virtual double CUniformCRV::doQuantile (double _p) const [inline], [protected], [virtual]

Quantile, formula implementation.

Implements CRandomVariable.

6.69.3.5 virtual double CUniformCRV::expectedValue ( ) const [inline], [virtual]

Returns expected value of the random variable.

Implements CRandomVariable.

6.69.3.6 ArrayXd CUniformCRV::exportDomain ( ) const [virtual]

Exports domain of the random variable.

Implements TRandomVariable< t, T >.

6.69.3.7 double CUniformCRV::lowerBound ( ) const [inline]

Returns lower bound of the uniform radnom variable.

6.69.3.8 virtual double CUniformCRV::maxValue ( ) const [inline], [virtual]

Returns maximal value of the random variable.

Implements CRandomVariable.

6.69.3.9 virtual double CUniformCRV::minValue ( ) const [inline], [virtual]

Returns minimal value of the random variable.

Implements CRandomVariable.

6.69.3.10 virtual double CUniformCRV::probability (double _x) const [inline], [virtual]

Function that returns PDF.

6.69.3.11 template<class Archive > void CUniformCRV::serialize (Archive & *ar*, const unsigned int *version*) [private]

6.69.3.12 void CUniformCRV::setDistribution (double *_a*, double *_b*) [virtual]

Set distribution parameters.

6.69.3.13 virtual void CUniformCRV::setDistribution (const CContinuousSample & *_aS*) [inline], [virtual]

Set distribution parameters from sample empirical parameters.

6.69.3.14 void CUniformCRV::setLowerBound (double *_a*) [inline]

Sets lower bound of the uniform radnom variable.

6.69.3.15 void CUniformCRV::setUpperBound (double _b) [inline]

Sets upper bound of the uniform radnom variable.

6.69.3.16 double CUniformCRV::upperBound ( ) const [inline]

Returns upper bound of the uniform radnom variable.

6.69.3.17 virtual double CUniformCRV::variance ( ) const [inline], [virtual]

Returns variance of the random variable.

Implements CRandomVariable.

6.69.4 Friends And Related Function Documentation

6.69.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.69.5 Member Data Documentation

6.69.5.1 double CUniformCRV::a [private]

6.69.5.2 double CUniformCRV::b [private]

6.69.5.3 double CUniformCRV::d [private]

Distribution parameters: random variable can have any value between a and b, (d=b-a).

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

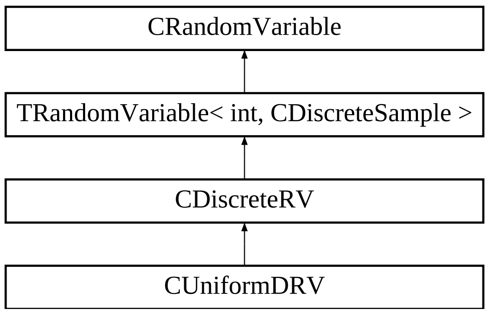
- C:/Development/core/RandomVariable.h
- C:/Development/core/RandomVariable.cpp

6.70 CUniformDRV Class Reference

Class for uniform discrete random variables derived from discrete random variables.

`#include <RandomVariable.h>`

Inheritance diagram for CUniformDRV:



Public Member Functions

- CUniformDRV ()
- virtual ∼CUniformDRV ()
- CUniformDRV (const CUniformDRV &O)
- virtual void setDistribution (int _a, int _b)

  Set distribution parameters.
- virtual double probability (int _k) const

  Function that returns PMF.
- virtual double cumulative (int _k) const

  Function that returns CDF.
- virtual double minValue () const

  Returns minimal value of the random variable.
- virtual double maxValue () const

  Returns maximal value of the random variable.
- virtual double expectedValue () const

  Returns expected value of the random variable.
- virtual distributiontype distributionType () const

  Returns enum type of the random variable distribution.
- virtual std::string distributionName () const

  Returns name of the random variable distribution.
- virtual ArrayXi exportDomain () const

  Exports domain of the random variable.
- int lowerBound () const

  Returns lower bound of the uniform radnom variable.
- int upperBound () const

  Returns upper bound of the uniform radnom variable.
- void setLowerBound (int _a)

  Sets lower bound of the uniform radnom variable.
- void setUpperBound (int _b)

  Sets upper bound of the uniform radnom variable.
- virtual double variance () const

  Returns variance of the random variable.

Protected Member Functions

- virtual double doQuantile (double _p) const

  Quantile, formula implementation.

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Private Attributes

- int a
- int b
- int n

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.70.1 Detailed Description

Class for uniform discrete random variables derived from discrete random variables.

6.70.2 Constructor & Destructor Documentation

6.70.2.1 CUniformDRV::CUniformDRV ( ) `[inline]`

6.70.2.2 virtual CUniformDRV::∼CUniformDRV ( ) `[inline], [virtual]`

6.70.2.3 CUniformDRV::CUniformDRV (const CUniformDRV & *O*) `[inline]`

6.70.3 Member Function Documentation

6.70.3.1 virtual double CUniformDRV::cumulative (int *_k*) const `[inline], [virtual]`

Function that returns CDF.

6.70.3.2 virtual std::string CUniformDRV::distributionName ( ) const `[inline], [virtual]`

Returns name of the random variable distribution.

Implements CRandomVariable.

6.70.3.3 virtual distributiontype CUniformDRV::distributionType ( ) const `[inline], [virtual]`

Returns enum type of the random variable distribution.

Implements CRandomVariable.

6.70.3.4 virtual double CUniformDRV::doQuantile (double *_p*) const `[inline], [protected], [virtual]`

Quantile, formula implementation.

Implements CRandomVariable.

6.70.3.5 virtual double CUniformDRV::expectedValue ( ) const `[inline], [virtual]`

Returns expected value of the random variable.

Implements CRandomVariable.

6.70.3.6 ArrayXi CUniformDRV::exportDomain ( ) const `[virtual]`

Exports domain of the random variable.

Implements TRandomVariable< t, T >.

6.70.3.7 int CUniformDRV::lowerBound ( ) const [inline]

Returns lower bound of the uniform radnom variable.

6.70.3.8 virtual double CUniformDRV::maxValue ( ) const [inline], [virtual]

Returns maximal value of the random variable.

Implements CRandomVariable.

6.70.3.9 virtual double CUniformDRV::minValue ( ) const [inline], [virtual]

Returns minimal value of the random variable.

Implements CRandomVariable.

6.70.3.10 virtual double CUniformDRV::probability (int _k) const [inline], [virtual]

Function that returns PMF.

6.70.3.11 template<class Archive > void CUniformDRV::serialize (Archive & *ar*, const unsigned int *version*) [private]

6.70.3.12 void CUniformDRV::setDistribution (int _a, int _b) [virtual]

Set distribution parameters.

6.70.3.13 void CUniformDRV::setLowerBound (int _a) [inline]

Sets lower bound of the uniform radnom variable.

6.70.3.14 void CUniformDRV::setUpperBound (int _b) [inline]

Sets upper bound of the uniform radnom variable.

6.70.3.15 int CUniformDRV::upperBound ( ) const [inline]

Returns upper bound of the uniform radnom variable.

6.70.3.16 virtual double CUniformDRV::variance ( ) const [inline], [virtual]

Returns variance of the random variable.

Implements CRandomVariable.

6.70.4 Friends And Related Function Documentation

6.70.4.1 friend class boost::serialization::access [friend]

Boost serialization.

6.70.5 Member Data Documentation

6.70.5.1 int CUniformDRV::a [private]

6.70.5.2 int CUniformDRV::b [private]

6.70.5.3 int CUniformDRV::n [private]

Distribution parameters: random variable can have one of the n=b-a+1 integer values between a and b.

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

- C:/Development/core/RandomVariable.h
- C:/Development/core/RandomVariable.cpp

6.71 Cx_ZetaGammax Class Reference

Class for the function f(x)=x-zeta∗gamma^[7](x).

`#include <VariousMath.h>`

Public Member Functions

- Cx_ZetaGammax (const int _N, const ArrayXd &_i2, const ArrayXd &_a2)
- double evaluate (double _x) const

Private Member Functions

- Cx_ZetaGammax ()

Private Attributes

- int N
- ArrayXd i2
- ArrayXd a2

6.71.1 Detailed Description

Class for the function f(x)=x-zeta∗gamma^[7](x).

6.71.2 Constructor & Destructor Documentation

6.71.2.1 Cx_ZetaGammax::Cx_ZetaGammax ( ) [inline], [private]

6.71.2.2 Cx_ZetaGammax::Cx_ZetaGammax (const int _N, const ArrayXd & _i2, const ArrayXd & _a2) [inline]

6.71.3 Member Function Documentation

6.71.3.1 double Cx_ZetaGammax::evaluate (double _x) const

6.71.4 Member Data Documentation

6.71.4.1 ArrayXd Cx_ZetaGammax::a2 `[private]`

6.71.4.2 ArrayXd Cx_ZetaGammax::i2 `[private]`

6.71.4.3 int Cx_ZetaGammax::N `[private]`

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

- C:/Development/core/VariousMath.h
- C:/Development/core/VariousMath.cpp

6.72 DSn Class Reference

```
#include <Ds.h>
```

Public Member Functions

- DSn (unsigned int var)

  constructor
- ∼DSn ()

  destructor
- long double doub ()

  generator

Private Types

- typedef long long int Long

Private Attributes

- unsigned int k
- unsigned int i
- unsigned int j
- Long n
- Array< long double, Dynamic, 1 > x
- Array< long double, Dynamic, 1 > w

6.72.1 Member Typedef Documentation

6.72.1.1 typedef long long int **DSn::Long** `[private]`

6.72.2 Constructor & Destructor Documentation

6.72.2.1 DSn::DSn (unsigned int *var*) `[inline]`

constructor

6.72.2.2 DSn::∼DSn ( ) `[inline]`

destructor

6.72.3 Member Function Documentation

6.72.3.1 long double DSn::doub ( ) `[inline]`

generator

6.72.4 Member Data Documentation

6.72.4.1 unsigned int DSn::i `[private]`

6.72.4.2 unsigned int DSn::j `[private]`

6.72.4.3 unsigned int DSn::k `[private]`

6.72.4.4 Long DSn::n `[private]`

6.72.4.5 Array<long double,Dynamic,1> DSn::w `[private]`

6.72.4.6 Array<long double,Dynamic,1> DSn::x `[private]`

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

- C:/Development/core/Ds.h

6.73 GoSUM Struct Reference

Classes

- class CAnalyticalModel

  Class for analytical representation of the model.
- class CAnalyticalOptimizationProblem

  Class for the optimization problem based on GoSUM analyitical model.
- class CConstraints

  Class for the constraints with parser functions.
- class CContainer

  Class for the GoSUM main project.
- class CContinuousMV
- class CCSvcSAM

  Class for the analyitical model for single output state, SVC type.
- class CCVoronoiHC
- class CDiscreteMV
- class CDSampleHC
- class CEpsSvrSAM

  Class for the analyitical model for single output state, epsilon-SVR type.
- class CEvaluator

  Class for GoSUM model evaluator.
- class CExeAsciiEvaluator

  Class for the evaluator with ascii i/o and .exe.
- class CExeEvaluator

  Template for the evaluator with some file i/o and .exe derived from CModelEvaluator.
- class CExeMatEvaluator

  Class for the evaluator with Matlab .mat i/o and .exe.

- class CHypercube
- class CInputParameters

  Class for GoSUM input parameters.
- class CLCVoronoiHC
- class CMatlabEngineEvaluator

  Class for the evaluator through Matlab engine derived from CModelEvaluator.
- class CMatlabShellEvaluator

  Class for the evaluator through Matlab engine and .mat i/o.
- class CModelConstraints
- class CModelEvaluator

  Class for GoSUM model evaluator.
- class CModelHypercube
- class CModelOptimizationVariable
- class CModelVariable

  Class for any variable in the GoSUM model (input or output).
- class CModelVariables

  Class for the vector of model variables (inputs & outputs).
- class CMonteCarloHC
- class CNuSvcSAM

  Class for the analyitical model for single output state, nu-SVC type.
- class CNuSvrSAM

  Class for the analyitical model for single output state, nu-SVR type.
- class COneClassSAM

  Class for the analyitical model for single output state, one class type.
- class COriginalOptimizationProblem

  Class for the optimization problem based on GoSUM analyitical model.
- class COutputStates

  Class for GoSUM output states.
- class CParserOptimizationProblem

  Class for the optimization problem with parser functions.
- class CReduction

  Class for sensitivity analyis of the model.
- class CScript

  Class for the GoSUM script format.
- class CSensitivityAnalysis

  Class for sensitivity analyis of the model.
- class CSimpleOptimizationProblem

  Class for the optimization problem based only on GoSUM input parameters.
- class CSingleAM

  Base class for the analyitical model for single output state, interface between analytical model and SVM.
- class TModelVariable

Public Types

- typedef TModelVariable
  < CDiscreteRV, CDiscreteSample,
  int > CTDiscreteMV
- typedef TModelVariable
  < CContinuousRV,
  CContinuousSample, double > CTContinuousMV
- typedef void(CScript::∗ paction)(std::istringstream &)

  Typdef for pointer to member function of CScript that is the response to speccific script commands.

Public Attributes

- NULL

6.73.1 Member Typedef Documentation

6.73.1.1 typedef TModelVariable<CContinuousRV,CContinuousSample,double> GoSUM::CTContinuousMV

6.73.1.2 typedef TModelVariable<CDiscreteRV,CDiscreteSample,int> GoSUM::CTDiscreteMV

6.73.1.3 typedef void(CScript::∗ GoSUM::paction)(std::istringstream &)

Typdef for pointer to member function of CScript that is the response to specciﬁc script commands.

6.73.2 Member Data Documentation

6.73.2.1 GoSUM::NULL

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

- C:/Development/core/AnalyticalModel.cpp
- C:/Development/core/ModelVariable.h
- C:/Development/core/Script.h

6.74 Ran Class Reference

```
#include <ran.h>
```

Public Member Functions

- Ran (Ullong j)
- Ullong int64 ()
- double doub ()
- unsigned int int32 ()

Private Attributes

- Ullong u
- Ullong v
- Ullong w

6.74.1 Constructor & Destructor Documentation

6.74.1.1 Ran::Ran (Ullong *j*) `[inline]`

6.74.2 Member Function Documentation

6.74.2.1 double Ran::doub ( ) `[inline]`

6.74.2.2 unsigned int Ran::int32 ( ) `[inline]`

6.74.2.3 Ullong Ran::int64 ( ) [inline]

6.74.3 Member Data Documentation

6.74.3.1 Ullong Ran::u [private]

6.74.3.2 Ullong Ran::v [private]

6.74.3.3 Ullong Ran::w [private]

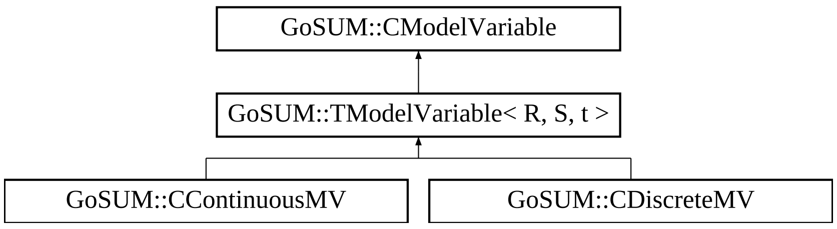
The documentation for this class was generated from the following file:

- C:/Development/core/ran.h

6.75 GoSUM::TModelVariable< R, S, t > Class Template Reference

`#include <ModelVariable.h>`

Inheritance diagram for GoSUM::TModelVariable< R, S, t >:



Public Member Functions

- TModelVariable ()
- virtual ∼TModelVariable ()
- virtual void clearSample ()

  Clears variable's sample.
- virtual int expandedSize () const
- virtual void setSampleSize (int _n)

  Returns number of variables after expansion for analyitical model.
- virtual int sampleSize () const

  Returns sample size.
- virtual void setSampleValue (double _val, int _at)

  Sets particular sample value.
- virtual double sampleValue (int _at) const

  Returns particular sample value.
- virtual void readSampleValue (std::ifstream &_ifs, int _at)

  Reads particular sample value from input file stream.
- virtual void writeSampleValue (std::ofstream &_ofs, int _at) const

  Writes particular sample value to output file stream.
- virtual void generateSampleValue (double _p, int _at)

  generates particular sample value using actual random variable model.
- virtual double generateSampleValue (double _p)

  Generates sample value using actual random variable model.
- virtual void computeStatistics (int _n)

Computes histogram and statistical indicators.
- virtual double minValue () const

  Returns minimal variable value.
- virtual double maxValue () const

  Returns maximal variable value.
- virtual double expectedValue () const

  Returns expected variable value.
- virtual CRandomVariable ∗ randomVariable () const

  Returns random variable.
- virtual CSample ∗ sample () const

  Returns sample.
- void setDistributionParameters (t _dp1, t _dp2=0)

  Set parameters of the theoretical distribution.
- virtual void setTheoreticalDistribution ()=0

  Detects distribution and turns random variable to appropirate type.
- virtual void setEmpiricalDistribution ()=0

  Compute distribution of the actual random variable from empirical sample data.
- Array< t, Dynamic, 1 > exportDomain () const

  Exports probability values for given _x values.
- ArrayXd exportProbability (const Array< t, Dynamic, 1 > &_x) const

  Exports probability values for given _x values.
- ArrayXd exportCumulative (const Array< t, Dynamic, 1 > &_x) const

  Exports cumulative values for given _x values.
- ArrayXd exportQuantile (const ArrayXd &_p) const

  Exports quantile values for given _x values.
- Array< t, Dynamic, 1 > exportSample () const

  Exports sample values.
- virtual
  CRandomVariable::distributiontype distributionType () const

  Returns type of the random variable distribution.
- virtual std::string distributionName () const

  Returns name of the random variable distribution.
- t normalizedHistogram (Array< t, Dynamic, 1 > &_x, ArrayXd &_H) const

  Returns normalized histogram (x,H).
- t exportHistogram (Array< t, Dynamic, 1 > &_x, ArrayXd &_H) const

  Returns histogram (x,H).
- void exportSubHistogram (ArrayXd &_subH, const std::vector< int > &subset) const

  Returns subhistogram.
- virtual bool isDistributionDefined () const

  Returns true if distribution is defined, false otherwise.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Protected Attributes

- R ∗ pRV

  Pointer to a random variable that models behaviour of model variable.
- S ∗ pS

Friends

- class boost::serialization::access

  Boost serialization.

6.75.1 Constructor & Destructor Documentation

6.75.1.1 template< class R , class S , typename t > GoSUM::TModelVariable< R, S, t >::TModelVariable ( ) [inline]

6.75.1.2 template< class R , class S , typename t > virtual GoSUM::TModelVariable< R, S, t >::∼TModelVariable ( ) [inline], [virtual]

6.75.2 Member Function Documentation

6.75.2.1 template< class R , class S , typename t > virtual void GoSUM::TModelVariable< R, S, t >::clearSample ( ) [inline], [virtual]

Clears variable's sample.

Implements GoSUM::CModelVariable.

6.75.2.2 template< class R , class S , typename t > virtual void GoSUM::TModelVariable< R, S, t >::computeStatistics (int *_n*) [inline], [virtual]

Computes histogram and statistical indicators.

Implements GoSUM::CModelVariable.

6.75.2.3 template< class R , class S , typename t > virtual std::string GoSUM::TModelVariable< R, S, t >::distributionName ( ) const [inline], [virtual]

Returns name of the random variable distribution.

Implements GoSUM::CModelVariable.

6.75.2.4 template< class R , class S , typename t > virtual CRandomVariable::distributiontype GoSUM::TModelVariable< R, S, t >::distributionType ( ) const [inline], [virtual]

Returns type of the random variable distribution.

Implements GoSUM::CModelVariable.

6.75.2.5 template< class R , class S , typename t > virtual int GoSUM::TModelVariable< R, S, t >::expandedSize ( ) const [inline], [virtual]

Implements GoSUM::CModelVariable.

6.75.2.6 template< class R , class S , typename t > virtual double GoSUM::TModelVariable< R, S, t >::expectedValue ( ) const [inline], [virtual]

Returns expected variable value.

Implements GoSUM::CModelVariable.

6.75.2.7 template< class R , class S , typename t > ArrayXd GoSUM::TModelVariable< R, S, t >::exportCumulative (const Array< t, Dynamic, 1 > & _x) const [inline]

Exports cumulative values for given _x values.

6.75.2.8 template< class R , class S , typename t > Array<t,Dynamic,1> GoSUM::TModelVariable< R, S, t >::exportDomain ( ) const [inline]

Exports probability values for given _x values.

6.75.2.9 template< class R , class S , typename t > t GoSUM::TModelVariable< R, S, t >::exportHistogram (Array< t, Dynamic, 1 > & _x, ArrayXd & _H) const [inline]

Returns histogram (x,H).

6.75.2.10 template< class R , class S , typename t > ArrayXd GoSUM::TModelVariable< R, S, t >::exportProbability (const Array< t, Dynamic, 1 > & _x) const [inline]

Exports probability values for given _x values.

6.75.2.11 template< class R , class S , typename t > ArrayXd GoSUM::TModelVariable< R, S, t >::exportQuantile (const ArrayXd & _p) const [inline]

Exports quantile values for given _x values.

6.75.2.12 template< class R , class S , typename t > Array<t,Dynamic,1> GoSUM::TModelVariable< R, S, t >::exportSample ( ) const [inline]

Exports sample values.

6.75.2.13 template< class R , class S , typename t > void GoSUM::TModelVariable< R, S, t >::exportSubHistogram (ArrayXd & _subH, const std::vector< int > & subset) const [inline]

Returns subhistogram.

6.75.2.14 template< class R , class S , typename t > virtual void GoSUM::TModelVariable< R, S, t >::generateSampleValue (double _p, int _at) [inline], [virtual]

generates particular sample value using actual random variable model.

Implements GoSUM::CModelVariable.

6.75.2.15 template< class R , class S , typename t > virtual double GoSUM::TModelVariable< R, S, t >::generateSampleValue (double _p) [inline], [virtual]

Generates sample value using actual random variable model.

Implements GoSUM::CModelVariable.

6.75.2.16 template< class R , class S , typename t > virtual bool GoSUM::TModelVariable< R, S, t >::isDistributionDefined ( ) const [inline], [virtual]

Returns true if distribution is defined, false otherwise.

Implements GoSUM::CModelVariable.

6.75.2.17 template< class R , class S , typename t > virtual double GoSUM::TModelVariable< R, S, t >::maxValue ( ) const [inline], [virtual]

Returns maximal variable value.

Implements GoSUM::CModelVariable.

6.75.2.18 template< class R , class S , typename t > virtual double GoSUM::TModelVariable< R, S, t >::minValue ( ) const [inline], [virtual]

Returns minimal variable value.

Implements GoSUM::CModelVariable.

6.75.2.19 template< class R , class S , typename t > t GoSUM::TModelVariable< R, S, t >::normalizedHistogram (Array< t, Dynamic, 1 > & *_x*, ArrayXd & *_H*) const [inline]

Returns normalized histogram (x,H).

6.75.2.20 template< class R , class S , typename t > virtual CRandomVariable* GoSUM::TModelVariable< R, S, t >::randomVariable ( ) const [inline], [virtual]

Returns random variable.

Implements GoSUM::CModelVariable.

6.75.2.21 template< class R , class S , typename t > virtual void GoSUM::TModelVariable< R, S, t >::readSampleValue (std::ifstream & *_ifs*, int *_at*) [inline], [virtual]

Reads particular sample value from input file stream.

Implements GoSUM::CModelVariable.

6.75.2.22 template< class R , class S , typename t > virtual CSample* GoSUM::TModelVariable< R, S, t >::sample ( ) const [inline], [virtual]

Returns sample.

Implements GoSUM::CModelVariable.

6.75.2.23 template< class R , class S , typename t > virtual int GoSUM::TModelVariable< R, S, t >::sampleSize ( ) const [inline], [virtual]

Returns sample size.

Implements GoSUM::CModelVariable.

6.75.2.24 template<class R , class S , typename t > virtual double **GoSUM::TModelVariable**< R, S, t >::sampleValue (int *_at*) const `[inline]`, `[virtual]`

Returns particular sample value.

Implements GoSUM::CModelVariable.

6.75.2.25 template<class R , class S , typename t > template<class Archive > void **GoSUM::TModelVariable**< R, S, t >::serialize (Archive & *ar*, const unsigned int *version*) `[inline]`, `[protected]`

Reimplemented from GoSUM::CModelVariable.

6.75.2.26 template<class R , class S , typename t > void **GoSUM::TModelVariable**< R, S, t >::setDistributionParameters (t *_dp1*, t *_dp2* = `0`) `[inline]`

Set parameters of the theoretical distribution.

6.75.2.27 template<class R , class S , typename t > virtual void **GoSUM::TModelVariable**< R, S, t >::setEmpiricalDistribution ( ) `[pure virtual]`

Compute distribution of the actual random variable from empirical sample data.

Reimplemented from GoSUM::CModelVariable.

Implemented in GoSUM::CContinuousMV, and GoSUM::CDiscreteMV.

6.75.2.28 template<class R , class S , typename t > virtual void **GoSUM::TModelVariable**< R, S, t >::setSampleSize (int *_n*) `[inline]`, `[virtual]`

Returns number of variables after expansion for analyitical model.

Sets sample size.

Implements GoSUM::CModelVariable.

6.75.2.29 template<class R , class S , typename t > virtual void **GoSUM::TModelVariable**< R, S, t >::setSampleValue (double *_val*, int *_at*) `[inline]`, `[virtual]`

Sets particular sample value.

Implements GoSUM::CModelVariable.

6.75.2.30 template<class R , class S , typename t > virtual void **GoSUM::TModelVariable**< R, S, t >::setTheoreticalDistribution ( ) `[pure virtual]`

Detects distribution and turns random variable to appropirate type.

Reimplemented from GoSUM::CModelVariable.

Implemented in GoSUM::CContinuousMV, and GoSUM::CDiscreteMV.

6.75.2.31 template<class R , class S , typename t > virtual void **GoSUM::TModelVariable**< R, S, t >::writeSampleValue (std::ofstream & *_ofs*, int *_at*) const `[inline]`, `[virtual]`

Writes particular sample value to output file stream.

Implements GoSUM::CModelVariable.

6.75.3 Friends And Related Function Documentation

6.75.3.1 template<class R , class S , typename t > friend class boost::serialization::access [friend]

Boost serialization.

6.75.4 Member Data Documentation

6.75.4.1 template<class R , class S , typename t > R∗ GoSUM::TModelVariable< R, S, t >::pRV [protected]

Pointer to a random variable that models behaviour of model variable.

6.75.4.2 template<class R , class S , typename t > S∗ GoSUM::TModelVariable< R, S, t >::pS [protected]

Pointer to the sample data of the model variable.

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

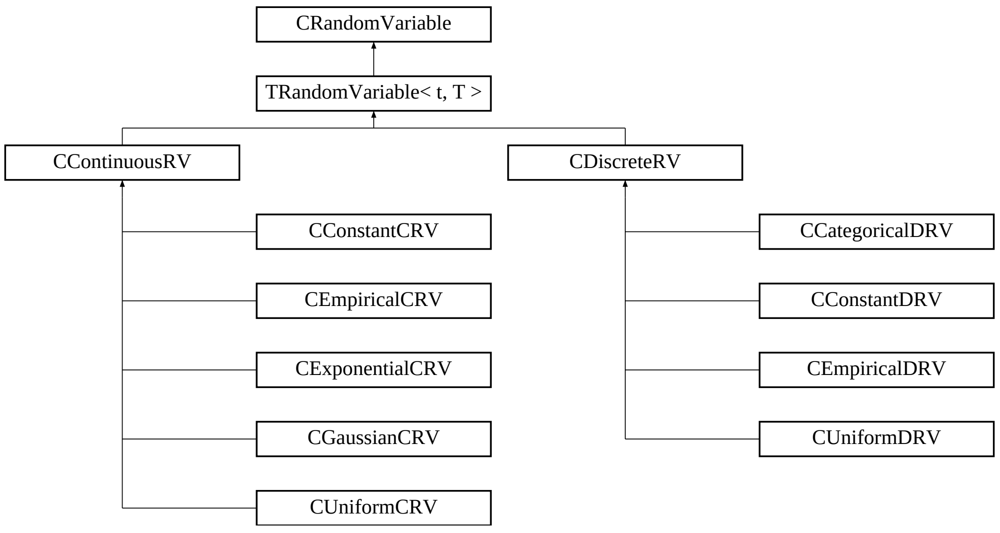
- C:/Development/core/ModelVariable.h

6.76 TRandomVariable< t, T > Class Template Reference

Template of an abstract class - covers two types of random variables: discrete (t=int,T=CDiscreteSample) or continuous (t=double,T=CContinuousSample).

```
#include <RandomVariable.h>
```

Inheritance diagram for TRandomVariable< t, T >:



Public Member Functions

- TRandomVariable ()
- virtual ∼TRandomVariable ()
- TRandomVariable (const TRandomVariable &O)
- virtual void setDistribution (t _dp1, t _dp2=0)

  Sets distribution parameters of the random variable.

- virtual void setDistribution (const T &_aS)

  Sets distribution of the random variable from sample.
- virtual double probability (t _x) const =0

  Returns probability mass function (PMF) or probability density function (PDF) for the random variable value _x.
- virtual double cumulative (t _x) const =0

  Returns cumulative distribution function (CDF) for the random variable value _x.
- rvExportMacro (Probability, probability, t) rvExportMacro(Cumulative
- t rvExportMacro (Quantile, quantile, double) virtual Array<t

  < Exports cumulative for an array of x values.
- t exportDomain () const =0

  Exports domain of the random variable.

Public Attributes

- cumulative
- t Dynamic

Private Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.76.1 Detailed Description

template<typename t, class T>class TRandomVariable< t, T >

Template of an abstract class - covers two types of random variables: discrete (t=int,T=CDiscreteSample) or continuous (t=double,T=CContinuousSample).

6.76.2 Constructor & Destructor Documentation

6.76.2.1 template<typename t , class T > TRandomVariable< t, T >::TRandomVariable ( ) [inline]

6.76.2.2 template<typename t , class T > virtual TRandomVariable< t, T >::~TRandomVariable ( ) [inline], [virtual]

6.76.2.3 template<typename t , class T > TRandomVariable< t, T >::TRandomVariable (const TRandomVariable< t, T > & *O*) [inline]

6.76.3 Member Function Documentation

6.76.3.1 template<typename t , class T > virtual double TRandomVariable< t, T >::cumulative (t *_x*) const [pure virtual]

Returns cumulative distribution function (CDF) for the random variable value _x.

6.76.3.2 template<typename t , class T > t TRandomVariable< t, T >::exportDomain ( ) const [pure virtual]

Exports domain of the random variable.

Implemented in CEmpiricalCRV, CExponentialCRV, CGaussianCRV, CUniformCRV, CConstantCRV, C-CategoricalDRV, CEmpiricalDRV, CUniformDRV, and CConstantDRV.

6.76.3.3 template<typename t , class T > virtual double TRandomVariable< t, T >::probability (t *_x*) const [pure virtual]

Returns probability mass function (PMF) or probability density function (PDF) for the random variable value _x.

6.76.3.4 template<typename t , class T > TRandomVariable< t, T >::rvExportMacro (Probability , probability , t)

6.76.3.5 template<typename t , class T > t TRandomVariable< t, T >::rvExportMacro (Quantile , quantile , double)

< Exports cumulative for an array of x values.

6.76.3.6 template<typename t , class T > template<class Archive > void TRandomVariable< t, T >::serialize (Archive & *ar,* const unsigned int *version*) [inline], [private]

6.76.3.7 template<typename t , class T > virtual void TRandomVariable< t, T >::setDistribution (t *_dp1,* t *_dp2* = 0) [inline], [virtual]

Sets distribution parameters of the random variable.

6.76.3.8 template<typename t , class T > virtual void TRandomVariable< t, T >::setDistribution (const T & *_aS*) [inline], [virtual]

Sets distribution of the random variable from sample.

6.76.4 Friends And Related Function Documentation

6.76.4.1 template<typename t , class T > friend class boost::serialization::access [friend]

Boost serialization.

6.76.5 Member Data Documentation

6.76.5.1 template<typename t , class T > TRandomVariable< t, T >::cumulative

6.76.5.2 template<typename t , class T > t TRandomVariable< t, T >::Dynamic

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

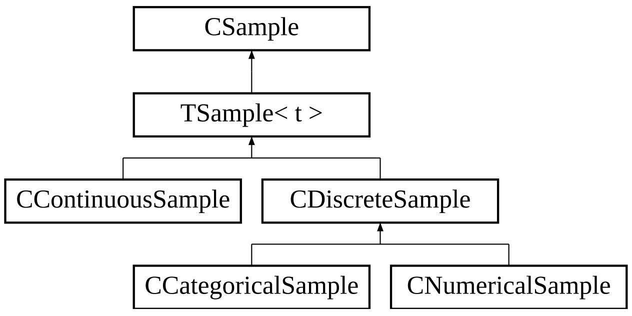
- C:/Development/core/RandomVariable.h

6.77 TSample< t > Class Template Reference

Template of an abstract class - covers two types of samples: discrete (t=int) or continuous (t=double).

`#include <Sample.h>`

Inheritance diagram for TSample< t >:



Public Member Functions

- TSample ()
- virtual ∼TSample ()
- TSample (const TSample &O)
- void clear ()

    Clears object.
- virtual void setSampleSize (int _n)

    (Re)sizes the sample, all previous data is lost.
- virtual int sampleSize () const

    Returns sample size (number of data in the sample).
- virtual void setSampleValue (double _val, int _at)

    Sets particular sample data value.
- t sampleValue (int _at) const

    Returns particular sample data value.
- virtual void readSampleValue (std::ifstream &_ifs, int _at)

    Reads particular sample data from input file stream.
- virtual void writeSampleValue (std::ofstream &_ofs, int _at) const

    < *Writes particular sample data to output file stream.*
- bool isConstant () const

    Returns true if it is a constant sample, false otherwise.
- t minValue () const

    Returns minimal sample data value.
- t maxValue () const

    Returns maximal sample data value.
- t normalizedHistogram (Array< t, Dynamic, 1 > &_x, ArrayXd &_H) const

    Returns normalized histogram (x,H).
- void cummulativeHistogram (Array< t, Dynamic, 1 > &_x, ArrayXd &_cH) const

    Returns cummulative histogram (x,cH).
- virtual t exportHistogram (Array< t, Dynamic, 1 > &_x, ArrayXd &_H) const =0

    Returns histogram (x,H).
- virtual void exportSubHistogram (ArrayXd &_subH, const std::vector< int > &subset) const =0

    Exports histogram relative to a subset of sample data.
- Array< t, Dynamic, 1 > exportSample () const

    Exports sample.
- virtual std::vector< int > select (double _left, double _right) const

    < *Returns indices of those sample values that are between _left and _right.*
- virtual void eraseSelected (const std::vector< int > &sel)

    Erases sample values on positions defiend by sel.

Protected Member Functions

- template<class Archive >
  void serialize (Archive &ar, const unsigned int version)

Protected Attributes

- Array< t, Dynamic, 1 > sample

  Array that holds sample data.
- Array< t, Dynamic, 1 > x

  Array that holds x-coordinate of the normalized histogram.
- ArrayXd H
- ArrayXd cH

  Array that holds normalized histogram.
- t range

Private Member Functions

- virtual void computeNormalizedHistogram (int _n)=0

  Computes normalized histogram from sample data.
- virtual void computeNormalizedSubHistogram (ArrayXd &_subH, const std::vector< int > &subset) const =0

  Computes normalized histogram from a subset of sample data.

Friends

- class boost::serialization::access

  Boost serialization.

Additional Inherited Members

6.77.1 Detailed Description

template<typename t>class TSample< t >

Template of an abstract class - covers two types of samples: discrete (t=int) or continuous (t=double).

6.77.2 Constructor & Destructor Documentation

6.77.2.1 template<typename t> TSample< t >::TSample ( ) [inline]

6.77.2.2 template<typename t> virtual TSample< t >::~TSample ( ) [inline], [virtual]

6.77.2.3 template<typename t> TSample< t >::TSample (const TSample< t > & *O*) [inline]

6.77.3 Member Function Documentation

6.77.3.1 template<typename t> void TSample< t >::clear ( ) [inline], [virtual]

Clears object.

Implements CSample.

6.77.3.2 template<typename t> virtual void TSample< t >::computeNormalizedHistogram (int _n) [private], [pure virtual]

Computes normalized histogram from sample data.

6.77.3.3 template<typename t> virtual void TSample< t >::computeNormalizedSubHistogram (ArrayXd & _subH, const std::vector< int > & subset) const [private], [pure virtual]

Computes normalized histogram from a subset of sample data.

6.77.3.4 template<typename t> void TSample< t >::cummulativeHistogram (Array< t, Dynamic, 1 > & _x, ArrayXd & _cH) const [inline]

Returns cummulative histogram (x,cH).

6.77.3.5 template<typename t> virtual void TSample< t >::eraseSelected (const std::vector< int > & sel) [inline], [virtual]

Erases sample values on positions defiend by sel.

Parameters

sel	Erases sample values on positions defiend by sel.

Implements CSample.

6.77.3.6 template<typename t> virtual t TSample< t >::exportHistogram (Array< t, Dynamic, 1 > & _x, ArrayXd & _H) const [pure virtual]

Returns histogram (x,H).

6.77.3.7 template<typename t> Array<t,Dynamic,1> TSample< t >::exportSample ( ) const [inline]

Exports sample.

6.77.3.8 template<typename t> virtual void TSample< t >::exportSubHistogram (ArrayXd & _subH, const std::vector< int > & subset) const [pure virtual]

Exports histogram relative to a subset of sample data.

Implemented in CContinuousSample, and CDiscreteSample.

6.77.3.9 template<typename t> bool TSample< t >::isConstant ( ) const [inline]

Returns true if it is a constant sample, false otherwise.

6.77.3.10 template<typename t> t TSample< t >::maxValue ( ) const [inline]

Returns maximal sample data value.

Reimplemented in CCategoricalSample, and CNumericalSample.

6.77.3.11 template<typename t> t TSample< t >::minValue ( ) const [inline]

Returns minimal sample data value.

Reimplemented in CCategoricalSample, and CNumericalSample.

6.77.3.12 template<typename t> t TSample< t >::normalizedHistogram (Array< t, Dynamic, 1 > & *_x*, ArrayXd & *_H*) const [inline]

Returns normalized histogram (x,H).

6.77.3.13 template<typename t> virtual void TSample< t >::readSampleValue (std::ifstream & *_ifs*, int *_at*) [inline], [virtual]

Reads particular sample data from input file stream.

Parameters

_at	Reads particular sample data from input file stream.

Implements CSample.

Reimplemented in CCategoricalSample, and CNumericalSample.

6.77.3.14 template<typename t> virtual int TSample< t >::sampleSize ( ) const [inline], [virtual]

Returns sample size (number of data in the sample).

Implements CSample.

6.77.3.15 template<typename t> t TSample< t >::sampleValue (int *_at*) const [inline]

Returns particular sample data value.

6.77.3.16 template<typename t> virtual std::vector<int> TSample< t >::select (double *_left*, double *_right*) const [inline], [virtual]

< Returns indices of those sample values that are between _left and _right.

Implements CSample.

6.77.3.17 template<typename t> template<class Archive > void TSample< t >::serialize (Archive & *ar*, const unsigned int *version*) [inline], [protected]

Reimplemented from CSample.

Reimplemented in CContinuousSample, and CDiscreteSample.

6.77.3.18 template<typename t> virtual void TSample< t >::setSampleSize (int *_n*) [inline], [virtual]

(Re)sizes the sample, all previous data is lost.

Implements CSample.

Reimplemented in CCategoricalSample, and CNumericalSample.

6.77.3.19 template<typename t> virtual void TSample< t >::setSampleValue (double _val, int _at) [inline], [virtual]

Sets particular sample data value.

Implements CSample.

6.77.3.20 template<typename t> virtual void TSample< t >::writeSampleValue (std::ofstream & _ofs, int _at) const [inline], [virtual]

< Writes particular sample data to output file stream.

Implements CSample.

Reimplemented in CCategoricalSample, and CNumericalSample.

6.77.4 Friends And Related Function Documentation

6.77.4.1 template<typename t> friend class boost::serialization::access [friend]

Boost serialization.

6.77.5 Member Data Documentation

6.77.5.1 template<typename t> ArrayXd TSample< t >::cH [protected]

Array that holds normalized histogram.

6.77.5.2 template<typename t> ArrayXd TSample< t >::H [protected]

6.77.5.3 template<typename t> t TSample< t >::range [protected]

Range of the sample data.

6.77.5.4 template<typename t> Array<t,Dynamic,1> TSample< t >::sample [protected]

Array that holds sample data.

6.77.5.5 template<typename t> Array<t,Dynamic,1> TSample< t >::x [protected]

Array that holds x-coordinate of the normalized histogram.

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

- C:/Development/core/Sample.h

Chapter 7

File Documentation

7.1 C:/Development/core/AnalyticalModel.cpp File Reference

```
#include "AnalyticalModel.h"
```

Classes

- struct GoSUM

7.2 C:/Development/core/AnalyticalModel.h File Reference

```
#include "Model.h"
#include "MADSOptimization.h"
#include "svm.h"
```

Classes

- class GoSUM::CSingleAM

  Base class for the analyitical model for single output state, interface between analytical model and SVM.
- class GoSUM::CCSvcSAM

  Class for the analyitical model for single output state, SVC type.
- class GoSUM::CNuSvcSAM

  Class for the analyitical model for single output state, nu-SVC type.
- class GoSUM::COneClassSAM

  Class for the analyitical model for single output state, one class type.
- class GoSUM::CEpsSvrSAM

  Class for the analyitical model for single output state, epsilon-SVR type.
- class GoSUM::CNuSvrSAM

  Class for the analyitical model for single output state, nu-SVR type.
- class GoSUM::CAnalyticalModel

  Class for analytical representation of the model.

Namespaces

- namespace GoSUM

    Namespace for GoSUM model.

7.3 C:/Development/core/Constraints.cpp File Reference

```
#include "Constraints.h"
#include "Model.h"
```

7.4 C:/Development/core/Constraints.h File Reference

```
#include "Utilities.h"
#include "VariousMath.h"
#include "fparser.hh"
```

Classes

- class GoSUM::CConstraints

    Class for the constraints with parser functions.
- class GoSUM::CModelConstraints

Namespaces

- namespace GoSUM

    Namespace for GoSUM model.

7.5 C:/Development/core/Container.cpp File Reference

```
#include "Container.h"
```

7.6 C:/Development/core/Container.h File Reference

```
#include "Reduction.h"
#include "MADSOptimization.h"
#include "GAOptimization.h"
#include "ParserOptimizationProblem.h"
#include "OriginalModel.h"
#include "Hypercube.h"
```

Classes

- class GoSUM::CContainer

    Class for the GoSUM main project.

Namespaces

- namespace GoSUM

  Namespace for GoSUM model.

7.7 C:/Development/core/Ds.cpp File Reference

```
#include "Ds.h"
```

Functions

- Array< long double, Dynamic, 1 > prepareDSample (unsigned int M)

7.7.1 Function Documentation

7.7.1.1 Array<long double,Dynamic,1> prepareDSample (unsigned int *M*)

7.8 C:/Development/core/Ds.h File Reference

```
#include <Eigen/Dense>
```

Classes

- class DSn

Functions

- Array< long double, Dynamic, 1 > prepareDSample (unsigned int M)

7.8.1 Function Documentation

7.8.1.1 Array<long double,Dynamic,1> prepareDSample (unsigned int *M*)

7.9 C:/Development/core/FFTWLibrary.cpp File Reference

```
#include "FFTWLibrary.h"
```

7.10 C:/Development/core/FFTWLibrary.h File Reference

```
#include "Utilities.h"
#include <windows.h>
#include <QLibrary>
#include <fftw3.h>
```

Classes

- class CFFTW

  Class interface for FFTW's libfftw library.

7.11 C:/Development/core/GAOptimization.cpp File Reference

```
#include "GAOptimization.h"
#include "GARealGenome.h"
```

Macros

- #define INSTANTIATE_REAL_GENOME

7.11.1 Macro Definition Documentation

7.11.1.1 #define INSTANTIATE_REAL_GENOME

7.12 C:/Development/core/GAOptimization.h File Reference

```
#include "ParserOptimizationProblem.h"
#include "ga.h"
```

Classes

- class CGAModelOptimization

  Class for the genetic algorithm, i.e. interface for GALIB.

7.13 C:/Development/core/Hypercube.cpp File Reference

```
#include "Hypercube.h"
#include "Model.h"
```

7.14 C:/Development/core/Hypercube.h File Reference

```
#include "RandomGenerators.h"
#include "Model.h"
```

Classes

- class GoSUM::CHypercube
- class GoSUM::CModelHypercube
- class GoSUM::CDSampleHC
- class GoSUM::CMonteCarloHC

- class GoSUM::CCVoronoiHC
- class GoSUM::CLCVoronoiHC

Namespaces

- namespace GoSUM

  Namespace for GoSUM model.

7.15 C:/Development/core/MADSOptimization.cpp File Reference

```
#include "MADSOptimization.h"
```

7.16 C:/Development/core/MADSOptimization.h File Reference

```
#include "OptimizationProblem.h"
#include <Mads.hpp>
```

Classes

- class CMADS

  Class for the mesh addaptive direct serach, i.e. interface for NOMAD.
- class CMADSEvaluator

  Subclass of the NOMAD::Evaluator class.

7.17 C:/Development/core/MatlabLibrary.cpp File Reference

```
#include "MatlabLibrary.h"
#include <windows.h>
```

7.18 C:/Development/core/MatlabLibrary.h File Reference

```
#include "Utilities.h"
#include <QLibrary>
#include <mat.h>
#include <engine.h>
```

Classes

- class CMATLAB

  Class interface for Matlab's libmat and libmx dynamic libraries.

Typedefs

- typedef MATFile ∗(∗ matftype1)(const char ∗, const char ∗)

    Typedefs for functions in Matlab's libmat dynamic library.
- typedef int(∗ matftype2)(MATFile ∗)
- typedef int(∗ matftype3)(MATFile ∗, const char ∗, const mxArray ∗)
- typedef mxArray ∗(∗ matftype4)(MATFile ∗, const char ∗)
- typedef mxArray ∗(∗ mxftype1)(mwSize, mwSize, mxComplexity)

    Typedefs for functions in Matlab's libmx dynamic library.
- typedef void(∗ mxftype2)(mxArray ∗)
- typedef double ∗(∗ mxftype3)(const mxArray ∗)
- typedef void(∗ mxftype4)(mxArray ∗pa, double ∗pr)
- typedef size_t(∗ mxftype5)(const mxArray ∗)
- typedef Engine ∗(∗ engftype1)(const char ∗, void ∗, int ∗)

    Typedefs for functions in Matlab's libeng dynamic library.
- typedef Engine ∗(∗ engftype2)(const char ∗)
- typedef int(∗ engftype3)(Engine ∗)
- typedef int(∗ engftype4)(Engine ∗, bool ∗)
- typedef int(∗ engftype5)(Engine ∗, bool)
- typedef int(∗ engftype6)(Engine ∗, const char ∗)
- typedef mxArray ∗(∗ engftype7)(Engine ∗, const char ∗)
- typedef int(∗ engftype8)(Engine ∗, const char ∗, const mxArray ∗)
- typedef int(∗ engftype9)(Engine ∗, char ∗, int)

7.18.1 Typedef Documentation

7.18.1.1 typedef Engine∗(∗ engftype1)(const char ∗, void ∗, int ∗)

Typedefs for functions in Matlab's libeng dynamic library.

7.18.1.2 typedef Engine∗(∗ engftype2)(const char ∗)

7.18.1.3 typedef int(∗ engftype3)(Engine ∗)

7.18.1.4 typedef int(∗ engftype4)(Engine ∗, bool ∗)

7.18.1.5 typedef int(∗ engftype5)(Engine ∗, bool)

7.18.1.6 typedef int(∗ engftype6)(Engine ∗, const char ∗)

7.18.1.7 typedef mxArray∗(∗ engftype7)(Engine ∗, const char ∗)

7.18.1.8 typedef int(∗ engftype8)(Engine ∗, const char ∗, const mxArray ∗)

7.18.1.9 typedef int(∗ engftype9)(Engine ∗, char ∗, int)

7.18.1.10 typedef MATFile∗(∗ matftype1)(const char ∗, const char ∗)

Typedefs for functions in Matlab's libmat dynamic library.

7.18.1.11 typedef int(∗ matftype2)(MATFile ∗)

7.18.1.12 typedef int(∗ matftype3)(MATFile ∗, const char ∗, const mxArray ∗)

7.18.1.13 typedef mxArray∗(∗ matftype4)(MATFile ∗, const char ∗)

7.18.1.14 typedef mxArray∗(∗ mxftype1)(mwSize,mwSize,mxComplexity)

Typedefs for functions in Matlab's libmx dynamic library.

7.18.1.15 typedef void(∗ mxftype2)(mxArray ∗)

7.18.1.16 typedef double∗(∗ mxftype3)(const mxArray ∗)

7.18.1.17 typedef void(∗ mxftype4)(mxArray ∗pa, double ∗pr)

7.18.1.18 typedef size_t(∗ mxftype5)(const mxArray ∗)

7.19 C:/Development/core/Model.cpp File Reference

```
#include "Model.h"
#include "Hypercube.h"
#include "OriginalModel.h"
```

7.20 C:/Development/core/Model.h File Reference

```
#include "ModelVariable.h"
#include "Constraints.h"
```

Classes

- class GoSUM::CModelVariables

  Class for the vector of model variables (inputs & outputs).
- class GoSUM::CInputParameters

  Class for GoSUM input parameters.
- class GoSUM::COutputStates

  Class for GoSUM output states.

Namespaces

- namespace GoSUM

  Namespace for GoSUM model.

7.21 C:/Development/core/ModelVariable.cpp File Reference

```
#include "ModelVariable.h"
```

7.22 C:/Development/core/ModelVariable.h File Reference

```
#include "Probability.h"
```

Classes

- class GoSUM::CModelVariable

  Class for any variable in the GoSUM model (input or output).
- class GoSUM::TModelVariable< R, S, t >
- class GoSUM::CDiscreteMV
- class GoSUM::CContinuousMV

Namespaces

- namespace GoSUM

  Namespace for GoSUM model.

7.23 C:/Development/core/OptimizationProblem.cpp File Reference

```
#include "OptimizationProblem.h"
```

7.24 C:/Development/core/OptimizationProblem.h File Reference

```
#include "Utilities.h"
```

Classes

- class COptimizationVariable
- class COptimizationProblem

  Class for the optimization problem.

7.25 C:/Development/core/OriginalModel.cpp File Reference

```
#include "OriginalModel.h"
#include <QFileInfo>
```

Variables

- enum
  GoSUM::CEvaluator::evaluatortype GoSUM

7.25.1 Variable Documentation

7.25.1.1 enum GoSUM::CReduction::cutofftype GoSUM

7.26 C:/Development/core/OriginalModel.h File Reference

```
#include <QProcess>
#include <QFile>
#include "Model.h"
#include "MatlabLibrary.h"
```

Classes

- class GoSUM::CEvaluator

  Class for GoSUM model evaluator.
- class GoSUM::CModelEvaluator

  Class for GoSUM model evaluator.
- class GoSUM::CExeEvaluator

  Template for the evaluator with some file i/o and .exe derived from CModelEvaluator.
- class GoSUM::CExeAsciiEvaluator

  Class for the evaluator with ascii i/o and .exe.
- class GoSUM::CExeMatEvaluator

  Class for the evaluator with Matlab .mat i/o and .exe.
- class GoSUM::CMatlabShellEvaluator

  Class for the evaluator through Matlab engine and .mat i/o.
- class GoSUM::CMatlabEngineEvaluator

  Class for the evaluator through Matlab engine derived from CModelEvaluator.

Namespaces

- namespace GoSUM

  Namespace for GoSUM model.

7.27 C:/Development/core/ParserOptimizationProblem.cpp File Reference

```
#include "ParserOptimizationProblem.h"
```

7.28 C:/Development/core/ParserOptimizationProblem.h File Reference

```
#include "OptimizationProblem.h"
#include "fparser.hh"
#include "AnalyticalModel.h"
```

Classes

- class GoSUM::CParserOptimizationProblem

  Class for the optimization problem with parser functions.
- class GoSUM::CModelOptimizationVariable
- class GoSUM::CSimpleOptimizationProblem

  Class for the optimization problem based only on GoSUM input parameters.
- class GoSUM::COriginalOptimizationProblem

  Class for the optimization problem based on GoSUM analyitical model.
- class GoSUM::CAnalyticalOptimizationProblem

  Class for the optimization problem based on GoSUM analyitical model.

Namespaces

- namespace GoSUM

  Namespace for GoSUM model.

7.29 C:/Development/core/Plot2D.cpp File Reference

```
#include "Plot2D.h"
```

7.30 C:/Development/core/Plot2D.h File Reference

```
#include <Eigen/Dense>
#include <QLayout>
#include "qwt_plot.h"
#include "qwt_plot_marker.h"
#include "qwt_plot_curve.h"
#include "qwt_plot_layout.h"
#include "qwt_legend.h"
#include "qwt_legend_item.h"
#include "qwt_symbol.h"
#include "qwt_plot_grid.h"
#include "qwt_plot_histogram.h"
#include "qwt_plot_spectrogram.h"
#include "qwt_color_map.h"
#include "qwt_matrix_raster_data.h"
#include "qwt_scale_widget.h"
#include "qwt_plot_picker.h"
#include "qwt_picker_machine.h"
#include "qwt_plot_renderer.h"
```

Classes

- class CPlot2D

7.31 C:/Development/core/Probability.cpp File Reference

```
#include "Probability.h"
```

Functions

- bool chiSquareTest (const CContinuousRV &_aRV, const CContinuousSample &_aS, const double chi_alpha)
- double KolmogorovSmirnovTest (const CContinuousRV &_aRV, const CContinuousSample &_aS)

7.31.1 Function Documentation

7.31.1.1 bool chiSquareTest (const **CContinuousRV** & *_aRV*, const **CContinuousSample** & *_aS*, const double *chi_alpha*)

brief Function that implements chi-sqaure test to determine if a continuous random variable is a good fit to a continuous sample.

7.31.1.2 double KolmogorovSmirnovTest (const **CContinuousRV** & *_aRV*, const **CContinuousSample** & *_aS*)

brief Function that implements Kolmogorov-Smirnov test to determine if a continuous random variable is a good fit to a continuous sample.

7.32 C:/Development/core/Probability.h File Reference

```
#include "RandomVariable.h"
```

Functions

- bool chiSquareTest (const CContinuousRV &_aRV, const CContinuousSample &_aS, const double chi_alpha)
- double KolmogorovSmirnovTest (const CContinuousRV &_aRV, const CContinuousSample &_aS)

7.32.1 Function Documentation

7.32.1.1 bool chiSquareTest (const **CContinuousRV** & *_aRV*, const **CContinuousSample** & *_aS*, const double *chi_alpha*)

brief Function that implements chi-sqaure test to determine if a continuous random variable is a good fit to a continuous sample.

7.32.1.2 double KolmogorovSmirnovTest (const **CContinuousRV** & *_aRV*, const **CContinuousSample** & *_aS*)

brief Function that implements Kolmogorov-Smirnov test to determine if a continuous random variable is a good fit to a continuous sample.

7.33 C:/Development/core/ran.h File Reference

Classes

- class Ran

Typedefs

- typedef unsigned long long int Ullong

7.33.1 Typedef Documentation

7.33.1.1 typedef unsigned long long int **Ullong**

7.34 C:/Development/core/RandomGenerators.cpp File Reference

```
#include "RandomGenerators.h"
```

Macros

- #define IA 16807L
- #define IM 2147483647L
- #define AM (1.0/IM)
- #define IQ 127773L
- #define IR 2836L
- #define NTAB 32
- #define NDIV (1+(IM-1)/NTAB)
- #define EPS 1.2e-7
- #define RNMX (1.0-EPS)
- #define IM1 2147483563L
- #define IM2 2147483399L
- #define AM (1.0/IM1)
- #define IMM1 (IM1-1)
- #define IA1 40014L
- #define IA2 40692L
- #define IQ1 53668L
- #define IQ2 52774L
- #define IR1 12211L
- #define IR2 3791
- #define NTAB 32
- #define NDIV (1+IMM1/NTAB)
- #define EPS 1.2e-7
- #define RNMX (1.0-EPS)
- #define MBIG 1000000000
- #define MSEED 161803398
- #define MZ 0
- #define FAC (1.0/MBIG)

7.34.1 Macro Definition Documentation

7.34.1.1 #define AM (1.0/IM)

7.34.1.2 #define AM (1.0/IM1)

7.34.1.3 #define EPS 1.2e-7

7.34.1.4 #define EPS 1.2e-7

7.34.1.5 #define FAC (1.0/MBIG)

7.34.1.6 #define IA 16807L

7.34.1.7 #define IA1 40014L

7.34.1.8 #define IA2 40692L

7.34.1.9 #define IM 2147483647L

7.34.1.10 #define IM1 2147483563L

7.34.1.11 #define IM2 2147483399L

7.34.1.12 #define IMM1 (IM1-1)

7.34.1.13 #define IQ 127773L

7.34.1.14 #define IQ1 53668L

7.34.1.15 #define IQ2 52774L

7.34.1.16 #define IR 2836L

7.34.1.17 #define IR1 12211L

7.34.1.18 #define IR2 3791

7.34.1.19 #define MBIG 1000000000

7.34.1.20 #define MSEED 161803398

7.34.1.21 #define MZ 0

7.34.1.22 #define NDIV (1+(IM-1)/NTAB)

7.34.1.23 #define NDIV (1+IMM1/NTAB)

7.34.1.24 #define NTAB 32

7.34.1.25 #define NTAB 32

7.34.1.26 #define RNMX (1.0-EPS)

7.34.1.27 #define RNMX (1.0-EPS)

7.35 C:/Development/core/RandomGenerators.h File Reference

```
#include <iostream>
#include <Eigen/Dense>
```

Classes

- class CBaseRNG

  Abstract base class for all uniform random number generators (RNG).
- class CLargePeriodRNG

  Class for uniform RNG with large period = 3.138∗10^57.
- class CDynamicSystemRNG

  Class for dynamic system uniform RNG.
- class CSmallPeriodRNG
- class CMediumPeriodRNG
- class CNLCRNG
- class CNomadRNG

  Class for NOMAD RNG with period = 2^96-1.
- class CRandomGenerator

  Class that holds all implemented uniform RNGs as static. and allows switching between them.

Macros

- #define UINT32_MAX 0xffffffff
- #define NTAB 32

  Class for uniform RNG with small period = 10^8.
- #define NTAB 32

  Class for uniform RNG with small period = 10^8.
- #define NTAB 32

  Class for uniform RNG with small period = 10^8.

7.35.1 Macro Definition Documentation

7.35.1.1 #define NTAB 32

Class for uniform RNG with small period = 10^8.

Class for uniform RNG which is not linearily congruential.

Class for uniform RNG with medium period = 2 ∗ 10^18.

7.35.1.2 #define NTAB 32

Class for uniform RNG with small period = 10^8.

Class for uniform RNG which is not linearily congruential.

Class for uniform RNG with medium period = 2 ∗ 10^18.

7.35.1.3 #define NTAB 32

Class for uniform RNG with small period = $10^\wedge 8$.

Class for uniform RNG which is not linearily congruential.

Class for uniform RNG with medium period = $2 * 10^\wedge 18$.

7.35.1.4 #define UINT32_MAX 0xffffffff

7.36 C:/Development/core/RandomVariable.cpp File Reference

```
#include "RandomVariable.h"
#include "FFTWLibrary.h"
```

7.37 C:/Development/core/RandomVariable.h File Reference

```
#include "Sample.h"
```

Classes

- class CRandomVariable

  Abstract base class for all random variables.
- class TRandomVariable< t, T >

  Template of an abstract class - covers two types of random variables: discrete (t=int,T=CDiscreteSample) or continuous (t=double,T=CContinuousSample).
- class CDiscreteRV
- class CContinuousRV
- class CConstantDRV

  Class for constant discrete random variables derived from discrete random variables.
- class CUniformDRV

  Class for uniform discrete random variables derived from discrete random variables.
- class CEmpiricalDRV

  Class for categorical discrete random variables derived from discrete random variables.
- class CCategoricalDRV

  Class for categorical discrete random variables derived from discrete random variables.
- class CConstantCRV

  Class for constant continuous random variables derived from continuous random variables.
- class CUniformCRV

  Class for uniform continuous random variables derived from continuous random variables.
- class CGaussianCRV

  Class for Gaussian continuous random variables derived from continuous random variables.
- class CExponentialCRV

  Class for exponential continuous random variables derived from continuous random variables.
- class CEmpiricalCRV

  Class for empirical continuous random variables derived from continuous random variables.

Macros

- #define rvExportMacro(F, f, arg)

Typedefs

- typedef TRandomVariable< int,
  CDiscreteSample > CTDiscreteRV

  Abstract class for all discrete random variables derived as specialization for t=int, T=TDiscreteSample.
- typedef TRandomVariable
  < double, CContinuousSample > CTContinuousRV

  Abstract class for all continuous random variables derived as specialization with t=double, T=CContinuousSample.

7.37.1 Macro Definition Documentation

7.37.1.1 #define rvExportMacro(*F,* *f,* *arg*)

Value:

```
public: \
ArrayXd export##F(const Array<arg,Dynamic,1> &_x) const \
{   \
    int i,n=_x.size(); \
    ArrayXd _f(n); \
    for ( i=0; i<n; i++ ) _f(i)=f(_x(i)); \
    return _f;  \
}
```

7.37.2 Typedef Documentation

7.37.2.1 typedef TRandomVariable<double,CContinuousSample> CTContinuousRV

Abstract class for all continuous random variables derived as specialization with t=double, T=CContinuousSample.

7.37.2.2 typedef TRandomVariable<int,CDiscreteSample> CTDiscreteRV

Abstract class for all discrete random variables derived as specialization for t=int, T=TDiscreteSample.

7.38 C:/Development/core/Reduction.cpp File Reference

```
#include "Reduction.h"
```

Functions

- bool compareFirst (std::pair< double, int > pair1, std::pair< double, int > pair2)

Variables

- enum
  GoSUM::CReduction::reductiontype GoSUM

7.38.1 Function Documentation

7.38.1.1 bool compareFirst (std::pair< double, int > *pair1,* std::pair< double, int > *pair2*)

7.38.2 Variable Documentation

7.38.2.1 enum GoSUM::CReduction::cutofftype GoSUM

7.39 C:/Development/core/Reduction.h File Reference

```
#include "SensitivityAnalysis.h"
```

Classes

- class GoSUM::CReduction

  Class for sensitivity analyis of the model.

Namespaces

- namespace GoSUM

  Namespace for GoSUM model.

7.40 C:/Development/core/Sample.cpp File Reference

```
#include "Sample.h"
```

7.41 C:/Development/core/Sample.h File Reference

```
#include "VariousMath.h"
```

Classes

- class CSample

  Abstract class for all samples.
- class TSample< t >

  Template of an abstract class - covers two types of samples: discrete (t=int) or continuous (t=double).
- class CDiscreteSample
- class CContinuousSample
- class CNumericalSample

  Abstract class for numerical discrete samples.
- class CCategoricalSample

  Abstract class for categorical discrete samples.

Typedefs

- typedef TSample< int > CTDiscreteSample

  Abstract class for all discrete samples derived as specialization with t=int.
- typedef TSample< double > CTContinuousSample

  Abstract class for all continuous samples derived as specialization with t=double.

7.41.1 Typedef Documentation

7.41.1.1 typedef **TSample**<double> **CTContinuousSample**

Abstract class for all continuous samples derived as specialization with t=double.

7.41.1.2 typedef **TSample**<int> **CTDiscreteSample**

Abstract class for all discrete samples derived as specialization with t=int.

7.42 C:/Development/core/Script.cpp File Reference

```
#include "Script.h"
```

7.43 C:/Development/core/Script.h File Reference

```
#include "Container.h"
```

Classes

- class GoSUM::CScript

    Class for the GoSUM script format.

Namespaces

- namespace GoSUM

    Namespace for GoSUM model.

7.44 C:/Development/core/SensitivityAnalysis.cpp File Reference

```
#include "SensitivityAnalysis.h"
#include "Hypercube.h"
```

7.45 C:/Development/core/SensitivityAnalysis.h File Reference

```
#include "AnalyticalModel.h"
```

Classes

- class GoSUM::CSensitivityAnalysis

    Class for sensitivity analyis of the model.

Namespaces

- namespace GoSUM

  Namespace for GoSUM model.

7.46 C:/Development/core/Utilities.cpp File Reference

```
#include "Utilities.h"
#include <windows.h>
```

Functions

- std::wstring string2WideString (const std::string &s)

  Some utility functions.

7.46.1 Function Documentation

7.46.1.1 std::wstring string2WideString (const std::string & *s*)

Some utility functions.

Converts string to wide string.

7.47 C:/Development/core/Utilities.h File Reference

```
#include <cmath>
```

```
#include <iostream>
#include <fstream>
#include <sstream>
#include <string>
#include <algorithm>
#include <utility>
#include <queue>
#include <boost/math/special_functions/erf.hpp>
#include <boost/math/distributions/chi_squared.hpp>
#include <boost/ptr_container/ptr_vector.hpp>
#include <boost/serialization/split_member.hpp>
#include <boost/serialization/nvp.hpp>
#include <boost/serialization/base_object.hpp>
#include <boost/serialization/utility.hpp>
#include <boost/serialization/vector.hpp>
#include <boost/serialization/string.hpp>
#include <boost/serialization/export.hpp>
#include <boost/ptr_container/serialize_ptr_vector.hpp>
#include <boost/config.hpp>
#include <boost/archive/text_iarchive.hpp>
#include <boost/archive/text_oarchive.hpp>
#include <boost/archive/binary_iarchive.hpp>
#include <boost/archive/binary_oarchive.hpp>
#include <boost/archive/xml_iarchive.hpp>
#include <boost/archive/xml_oarchive.hpp>
#include <boost/thread.hpp>
#include <boost/signal.hpp>
#include <boost/bind.hpp>
#include <Eigen/Dense>
```

Namespaces

- namespace boost
- namespace boost::serialization

Macros

- #define _USE_MATH_DEFINES
- #define SIGNALSLIB_HPP_INCLUDED
- #define boostSerializeArrayXdiMacro(A)

    Boost serialization for some Eigen Arrays.
- #define boostSerializeArrayXXdiMacro(B)

Functions

- std::wstring string2WideString (const std::string &s)

    Some utility functions.

7.47.1 Macro Definition Documentation

7.47.1.1 #define _USE_MATH_DEFINES

7.47.1.2 #define boostSerializeArrayXdiMacro(*A*)

Value:

```
template<class Archive> \
void save(Archive &ar,const A &a,const unsigned int version) \
{   int i,n=int(a.size()); \
    ar << boost::serialization::make_nvp("size",n); \
    for ( i=0; i<n; i++ )  ar << boost::serialization::make_nvp("data",a(i)); \
} \
template<class Archive> \
void load(Archive &ar,A &a,const unsigned int version) \
{   int i,n; \
    ar >> boost::serialization::make_nvp("size",n); \
    a.resize(n); \
    for ( i=0; i<n; i++ )  ar >> boost::serialization::make_nvp("data",a(i)); \
}
```

Boost serialization for some Eigen Arrays.

7.47.1.3 #define boostSerializeArrayXXdiMacro(*B*)

Value:

```
template<class Archive> \
void save(Archive &ar,const B &a,const unsigned int version) \
{   int i,j,n=int(a.rows()),m=int(a.cols()); \
    ar << boost::serialization::make_nvp("rows",n); \
    ar << boost::serialization::make_nvp("cols",m); \
    for ( i=0; i<n; i++ ) \
       for ( j=0; j<m; j++ ) \
            ar << boost::serialization::make_nvp("data",a(i,j)); \
} \
template<class Archive> \
void load(Archive &ar,B &a,const unsigned int version) \
{   int i,j,n,m; \
    ar >> boost::serialization::make_nvp("rows",n); \
    ar >> boost::serialization::make_nvp("cols",m); \
    a.resize(n,m); \
    for ( i=0; i<n; i++ ) \
        for ( j=0; j<m; j++ ) \
            ar >> boost::serialization::make_nvp("data",a(i,j)); \
}
```

7.47.1.4 #define SIGNALSLIB_HPP_INCLUDED

7.47.2 Function Documentation

7.47.2.1 std::wstring string2WideString (const std::string & *s*)

Some utility functions.

Converts string to wide string.

7.48 C:/Development/core/VariousMath.cpp File Reference

```
#include "VariousMath.h"
```

Functions

- double linearInterpolation (const ArrayXd &X, const ArrayXd &Y, double x)

    Linear interpolation Y(x)=Yl+((Yr-Yl)/(Xr-Xl))∗(x-Xl).

- void cumulativeSum (ArrayXd &a)

  Returns cummulative sum of elements of the array.
- double variance (ArrayXd &a)

  Returns variance of elements of the array.
- ArrayXi permutation (int N)

  Generates one random permutation of (1,...,N).
- ArrayXXi permutations (int n, int N)

  Generates n random permutations of (1,...,N).
- double squareDistance (const ArrayXd &a, const ArrayXd &b)

  Returns squared distance between a and b as points.
- int findNearest (const std::vector< ArrayXd > &v, const ArrayXd &y)

  Returns index of the point beetween points v nearest to the point y.

7.48.1 Function Documentation

7.48.1.1 void cumulativeSum (ArrayXd & *a*)

Returns cummulative sum of elements of the array.

7.48.1.2 int findNearest (const std::vector< ArrayXd > & *v*, const ArrayXd & *y*)

Returns index of the point beetween points v nearest to the point y.

7.48.1.3 double linearInterpolation (const ArrayXd & *X*, const ArrayXd & *Y*, double *x*)

Linear interpolation Y(x)=Yl+((Yr-Yl)/(Xr-Xl))$*$(x-Xl).

7.48.1.4 ArrayXi permutation (int *N*)

Generates one random permutation of (1,...,N).

7.48.1.5 ArrayXXi permutations (int *n*, int *N*)

Generates n random permutations of (1,...,N).

7.48.1.6 double squareDistance (const ArrayXd & *a*, const ArrayXd & *b*)

Returns squared distance between a and b as points.

7.48.1.7 double variance (ArrayXd & *a*)

Returns variance of elements of the array.

7.49 C:/Development/core/VariousMath.h File Reference

```
#include "Utilities.h"
#include "ran.h"
#include "Ds.h"
```

Classes

- class Cx_ZetaGammax

  Class for the function f(x)=x-zeta∗gamma^[7](x).

Macros

- #define TINY 100∗(std::numeric_limits<double>::epsilon())

Functions

- template<class T >
  double findRoot (const T &fnc, double a, double b)

  Finds _x in the interval (a,b) such that f(_x)=0.
- ArrayXi permutation (int N)

  Generates one random permutation of (1,...,N).
- ArrayXXi permutations (int n, int N)

  Generates n random permutations of (1,...,N).
- double variance (ArrayXd &a)

  Returns variance of elements of the array.
- double linearInterpolation (const ArrayXd &X, const ArrayXd &Y, double x)

  Linear interpolation Y(x)=Yl+((Yr-Yl)/(Xr-Xl))∗(x-Xl).
- void cumulativeSum (ArrayXd &a)

  Returns cummulative sum of elements of the array.
- double squareDistance (const ArrayXd &a, const ArrayXd &b)

  Returns squared distance between a and b as points.
- int findNearest (const std::vector< ArrayXd > &v, const ArrayXd &y)

  Returns index of the point beetween points v nearest to the point y.

7.49.1 Macro Definition Documentation

7.49.1.1 #define TINY 100∗(std::numeric_limits<double>::epsilon())

7.49.2 Function Documentation

7.49.2.1 void cumulativeSum (ArrayXd & *a*)

Returns cummulative sum of elements of the array.

7.49.2.2 int findNearest (const std::vector< ArrayXd > & *v*, const ArrayXd & *y*)

Returns index of the point beetween points v nearest to the point y.

7.49.2.3 template<class T > double findRoot (const T & *fnc*, double *a*, double *b*)

Finds _x in the interval (a,b) such that f(_x)=0.

Returns

True if root is found, false otherwise.

7.49.2.4 double linearInterpolation (const ArrayXd & *X*, const ArrayXd & *Y*, double *x*)

Linear interpolation Y(x)=Yl+((Yr-Yl)/(Xr-Xl))∗(x-Xl).

7.49.2.5 ArrayXi permutation (int *N*)

Generates one random permutation of (1,...,N).

7.49.2.6 ArrayXXi permutations (int *n*, int *N*)

Generates n random permutations of (1,...,N).

7.49.2.7 double squareDistance (const ArrayXd & *a*, const ArrayXd & *b*)

Returns squared distance between a and b as points.

7.49.2.8 double variance (ArrayXd & *a*)

Returns variance of elements of the array.

Index