AMORE++

pre-alpha (active development aiming to release a beta version this summer (2011))

Generated by Doxygen 1.7.4

Mon Jun 13 2011 18:20:30

Contents

Chapter 1

The AMORE++ package

1.1 Introduction

Here you will find the documentation of the C++ component of the AMORE++ R package.

The AMORE++ package is a new version of the publicly available AMORE package for neural network training and simulation under R

1.2 Motivation

Since the release of the previous version of the AMORE many things have changed in the R programming world.

The advent of the Reference Classes and of packages like Rcpp, inline and RUnit compel us to write a better version of the package in order to provide a more useful framework for neural network training and simulation.

1.3 Road Map

This project is currently very active and the development team intends to provide a beta version as soon as this summer (2011)

Chapter 2

Class Index

2.1 Class Hierarchy

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

Chapter 3

Class Index

3.1 Class List

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

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

Chapter 5

Class Documentation

5.1 CompareId Struct Reference

Public Member Functions

- bool operator() (const ConPtr a, const ConPtr b)
- bool operator() (const ConPtr a, const int b)
- bool operator() (const int a, const ConPtr b)
- bool operator() (const int a, const int b)

5.1.1 Detailed Description

Definition at line 352 of file ConContainer.cpp.

5.1.2 Member Function Documentation

5.1.2.1 bool CompareId::operator() (const ConPtr *a*, const ConPtr *b*) `[inline]`

Definition at line 356 of file ConContainer.cpp.

```
{
  return a->getId() < b->getId();
}
```

5.1.2.2 bool CompareId::operator() (const int *a*, const int *b*) `[inline]`

Definition at line 377 of file ConContainer.cpp.

```
{
  return a < b;
}
```

5.1.2.3 bool CompareId::operator() (const int *a*, const **ConPtr** *b*) `[inline]`

Definition at line 370 of file ConContainer.cpp.

```
  {
    return a < b->getId();
  }
```

5.1.2.4 bool CompareId::operator() (const **ConPtr** *a*, const int *b*) `[inline]`

Definition at line 363 of file ConContainer.cpp.

```
  {
    return a->getId() < b;
  }
```

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

- pkg/AMORE/src/old/ConContainer.cpp

5.2 Con Class Reference

A class to handle the information needed to describe an input connection.

`#include <Con.h>`

Public Member Functions

- Con ()

  Default Constructor.
- Con (NeuronPtr neuronPtr)

  Constructor.
- Con (NeuronPtr neuronPtr, double weight)

  Constructor.
- NeuronPtr getFrom ()

  from field accessor.
- int getId ()

  A getter of the Id of the Neuron pointed by the from field.
- double getWeight ()

  weight field accessor.
- void setFrom (NeuronPtr neuronPtr)

  from field accessor.
- void setWeight (double weight)

  weight field accessor.

- void show ()

  Pretty print of the Con information.
- bool validate ()

  Object validator.
- Con ()
- Con (NeuronPtr neuronPtr)
- Con (NeuronPtr neuronPtr, double value)
- ∼Con ()

  Default Destructor.
- NeuronPtr getFrom ()
- void setFrom (NeuronPtr neuronPtr)
- int getId ()
- double getWeight ()
- void setWeight (double value)
- bool show ()
- bool validate ()

Protected Attributes

- NeuronWeakPtr from

  A smart pointer to the Neuron used as input during simulation or training.
- double weight

  A double variable that contains the weight of the connection.

5.2.1 Detailed Description

A class to handle the information needed to describe an input connection.

The Con class provides a simple class for a connection described by a pair of values: a pointer to a Neuron object used as the from field and the weight used to propagate the value of that Neuron object.

Definition at line 3 of file Con.h.

5.2.2 Constructor & Destructor Documentation

5.2.2.1 Con::Con ( )

Default Constructor.

Definition at line 17 of file Con.cpp.

```
            :
  weight(0), from()
{
}
```

5.2.2.2 Con::Con (**NeuronPtr** *neuronPtr*)

Constructor.

Definition at line 28 of file Con.cpp.

```
                                           :
  from(neuronPtr), weight(0)
{
}
```

5.2.2.3 Con::Con (**NeuronPtr** *neuronPtr,* double *weight*)

Constructor.

Definition at line 40 of file Con.cpp.

```
                                                    :
  from(neuronPtr), weight(weight)
{
}
```

5.2.2.4 Con::Con ( )

5.2.2.5 Con::Con (**NeuronPtr** *neuronPtr*)

5.2.2.6 Con::Con (**NeuronPtr** *neuronPtr,* double *value*)

5.2.2.7 Con::∼Con ( )

Default Destructor.

Definition at line 46 of file Con.cpp.

```
{
}
```

5.2.3 Member Function Documentation

5.2.3.1 **NeuronPtr** Con::getFrom ( )

from field accessor.

This method allows access to the address stored in the private from field (a pointer to a Neuron object).∗

Returns

A pointer to the Neuron object referred to by the from field.

```
    //================
    //Usage example:
    //================
    // Data set up
                    NeuronPtr ptShNeuron ( new Neuron(1) );          // Neuron
     Id is set 1
                    ConPtr ptShCon( new Con(ptShNeuron) );           // from p
  oints to ptShNeuron and weight is set to 0
    // Test
                    ptShNeuron = ptShCon->getFrom() ;
                    int result = ptShNeuron->getId();

    // Now, result is equal to 1.
```

See also

getId and the unit test files, e.g., runit.Cpp.Con.R, for further examples.

Definition at line 67 of file Con.cpp.

References from.

```
{
  return (from.lock());
}
```

5.2.3.2 NeuronPtr Con::getFrom ( )

5.2.3.3 int Con::getId ( )

A getter of the Id of the Neuron pointed by the from field.

This method gets the Id of the Neuron referred to by the from field

Returns

The value of the Id (an integer).

```
  //================
  //Usage example:
  //================
  // Data set up
                  NeuronPtr ptShNeuron ( new Neuron(16) );         // Neuron I
  d is set to 16
                  ConPtr ptShCon( new Con(ptShNeuron) );           // from poi
  nts to ptShNeuron and weight is set to 0
  // Test
                  int result = ptShCon->getId();

  // Now, result is equal to 16.
```

See also

getFrom, setFrom and the unit test files, e.g., runit.Cpp.Con.R, for further examples.

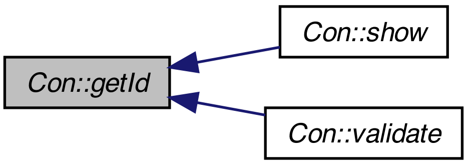
Definition at line 94 of file Con.cpp.

References from.

Referenced by show(), and validate().

```
{
  if (from.use_count() > 0)
    {
      NeuronPtr neuronPtr(from);
      return (neuronPtr->getId());
    }
  else
    {
      return (NA_INTEGER);
    }
}
```

Here is the caller graph for this function:



5.2.3.4 int Con::getId ( )

5.2.3.5 double Con::getWeight ( )

5.2.3.6 double Con::getWeight ( )

weight field accessor.

This method allows access to the value stored in the private field weight

Returns

The value of weight (double)

```
  //================
  //Usage example:
  //================
  // Data set up
                      std::vector<double> result;
```

```
                  NeuronPtr ptShNeuron ( new Neuron(16) );                /
/ Neuron Id is set to 16
                  ConPtr ptShCon( new Con(ptShNeuron, 12.4) );  // from poi
nts to ptShNeuron and weight is set to 12.4
  // Test
                  result.push_back( ptShCon->getWeight() );
                  ptShCon->setWeight(2.2);
                  result.push_back( ptShCon->getWeight() );

  // Now, result is a numeric vector that contains the values 12.4 and 2.2
.
```

See also

setWeight and the unit test files, e.g., runit.Cpp.Con.R, for further examples.

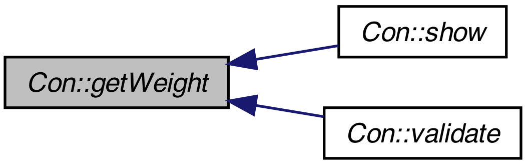
Definition at line 160 of file Con.cpp.

References weight.

Referenced by show(), and validate().

```
{
  return (weight);
}
```

Here is the caller graph for this function:



5.2.3.7 void Con::setFrom (NeuronPtr *neuronPtr*)

from field accessor.

This method sets the value of the from field with the address used as parameter.

Parameters

f	A pointer to the neuron that is to be inserted in the from field.

```
        //================
        //Usage example:
        //=================
        // Data set up
                        NeuronPtr ptShNeuron ( new Neuron(1) );         // Neuron
       Id is set to 1
                        ConPtr ptShCon( new Con() );
                        ptShCon->setFrom( ptShNeuron );
        // Test
                        ptShNeuron = ptShCon->getFrom() ;
                        int result = ptShNeuron->getId();

        // Now, result is equal to 1
```

See also

getFrom and getId contain usage examples. For further examples see the unit test files, e.g., runit.Cpp.Con.R

Definition at line 131 of file Con.cpp.

References from.

```
{
  from = neuronPtr;
}
```

5.2.3.8 void Con::setFrom (NeuronPtr *neuronPtr*)

5.2.3.9 void Con::setWeight (double *value*)

weight field accessor.

This method sets the value of the weight field.

Parameters

w	The new value (double) to be set in the weight field.

```
  //=================
  //Usage example:
  //=================
  // Data set up
                        std::vector<double> result;
                        NeuronPtr ptShNeuron ( new Neuron(16) );                /
      / Neuron Id is set to 16
                        ConPtr ptShCon( new Con(ptShNeuron, 12.4) );  // from poi
      nts to ptShNeuron and weight is set to 12.4
                        result.push_back(ptShCon->getWeight());
        // Test
                        ptShCon->setWeight(2.2);
                        result.push_back(ptShCon->getWeight());

        // Now, result is a numeric vector that contains the values 12.4 and 2.2
      .
```

See also

getWeight and the unit test files (e.g. runit.Cpp.Con.R)

Definition at line 188 of file Con.cpp.

References weight.

```
{
  weight = value;
}
```

5.2.3.10 void Con::setWeight (double *value*)

5.2.3.11 bool Con::show ( )

5.2.3.12 bool Con::show ( )

Pretty print of the Con information.

This method outputs in the R terminal the contents of the Con fields.

Returns

true in case everything works without throwing an exception

See also

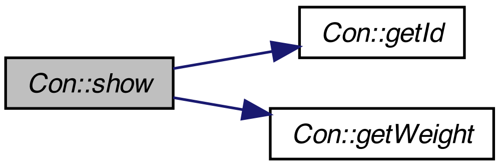
setWeight and the unit test files, e.g., runit.Cpp.Con.R, for usage examples.

Definition at line 199 of file Con.cpp.

References getId(), and getWeight().

```
{
  int id = getId();
  if (id == NA_INTEGER)
    {
      Rprintf("From: NA\t Invalid Connection \n");
    }
  else
    {
      Rprintf("From:\t %d \t Weight= \t %lf \n", id, getWeight());
    }
}
```

Here is the call graph for this function:



5.2.3.13 bool Con::validate ( )

Object validator.

This method checks the object for internal coherence. A try / catch mechanism exits normal execution and returns control to the R terminal in case the contents of the Con object are identified as corrupted.

Returns

true in case the checks are Ok.

Exceptions

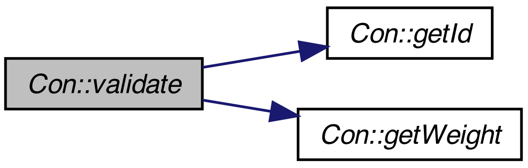
An	std::range error if weight or from are not finite.

Definition at line 219 of file Con.cpp.

References getId(), and getWeight().

```
{
  BEGIN_RCPP
  if (! R_FINITE(getWeight()) ) throw std::range_error("weight is not finite.");
  if (getId() == NA_INTEGER)
    throw std::range_error("fromId is not finite.");
  return (true);
END_RCPP}
```

Here is the call graph for this function:



5.2.3.14 bool Con::validate ( )

5.2.4 Member Data Documentation

5.2.4.1 NeuronWeakPtr Con::from [protected]

A smart pointer to the Neuron used as input during simulation or training.

The from field contains the address of the Neuron whose output will be used as input by the Neuron containing the Con object.

Definition at line 7 of file Con.h.

Referenced by getFrom(), getId(), and setFrom().

5.2.4.2 double Con::weight [protected]

A double variable that contains the weight of the connection.

The weight field contains the factor by which the output value of the Neuron addressed by the from field is multiplied during simulation or training.

Definition at line 8 of file Con.h.

Referenced by getWeight(), and setWeight().

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

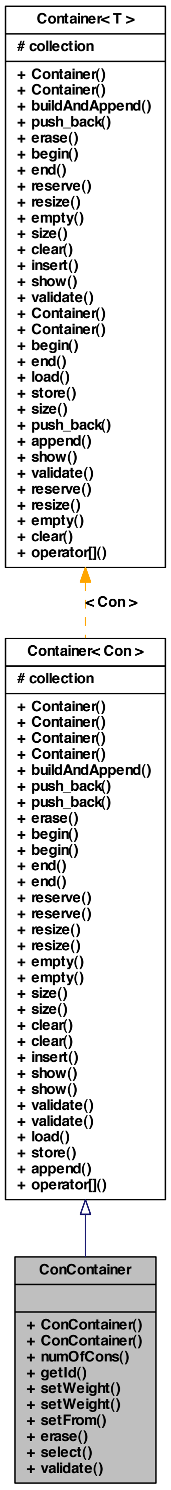
- pkg/AMORE/src/Con.h
- pkg/AMORE/src/old/Con.h
- pkg/AMORE/src/Con.cpp
- pkg/AMORE/src/old/Con.cpp

5.3 ConContainer Class Reference

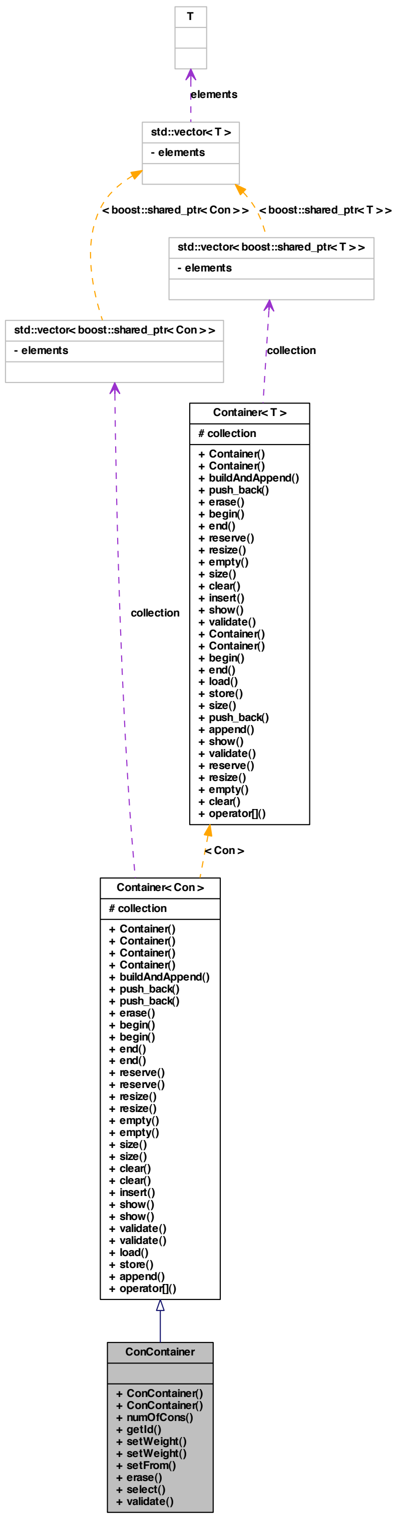
A vector of connections.

```
#include <ConContainer.h>
```

Inheritance diagram for ConContainer:



Collaboration diagram for ConContainer:



Public Types

- typedef std::vector< boost::shared_ptr< Con > >::iterator iterator
- typedef std::vector< boost::shared_ptr< Con > >::const_iterator const_iterator
- typedef boost::shared_ptr< Con > value_type
- typedef value_type const & const_reference

Public Member Functions

- ConContainer ()
- ConContainer (std::vector< ConPtr > collection)
- int numOfCons ()

  Size of the ConContainer object.
- std::vector< int > getId ()

  Getter of the Id values of the vector of Cons.
- bool setWeight (std::vector< double > nWeights)

  Setter of the weight field of the Con objects related to ConContainer.
- bool setWeight (std::vector< double > nWeights, std::vector< int > nIds)

  Setter of the weights of the specified elements from the ConContainer object.
- bool setFrom (NeuronContainer neuronContainer)

  Setter of the from fields of the Con objects related to ConContainer.
- void erase (std::vector< int > nIds)

  Erase the specified elements from the vecCom object.
- ConContainerPtr select (std::vector< int > nIds)

  Selects the specified elements from the vecCom object.
- bool validate ()

  Object validator.

5.3.1 Detailed Description

A vector of connections.

The ConContainer class provides a simple class for a vector of connections. It's named after the R equivalent Reference Class.

Definition at line 16 of file ConContainer.h.

5.3.2 Member Typedef Documentation

5.3.2.1 typedef std::vector<boost::shared_ptr<Con> >::const_iterator ConContainer::const_iterator

Reimplemented from Container< Con >.

Definition at line 23 of file ConContainer.h.

5.3.2.2 typedef value_type const& ConContainer::const_reference

Reimplemented from Container< Con >.

Definition at line 27 of file ConContainer.h.

5.3.2.3 typedef std::vector<boost::shared_ptr<Con> >::iterator ConContainer::iterator

Reimplemented from Container< Con >.

Definition at line 21 of file ConContainer.h.

5.3.2.4 typedef boost::shared_ptr<Con> ConContainer::value_type

Reimplemented from Container< Con >.

Definition at line 25 of file ConContainer.h.

5.3.3 Constructor & Destructor Documentation

5.3.3.1 ConContainer::ConContainer ( )

Definition at line 8 of file ConContainer.cpp.

```
{
}
```

5.3.3.2 ConContainer::ConContainer (std::vector< ConPtr > *collection*)

Definition at line 12 of file ConContainer.cpp.

```
                                                                      :
  Container<Con> (collection) // Call to Base constructor
{
}
```

5.3.4 Member Function Documentation

5.3.4.1 void ConContainer::erase (std::vector< int > *nIds*)

Erase the specified elements from the vecCom object.

Provides a convenient way of removing some Con objects from the collection field of the ConContainer object.

Parameters

vFrom	An std::vector<int> with the Ids of the connections to remove.

```
    //================
    //Usage example:
    //================

    // Data set up
                    std::vector<int> result;
                    std::vector<NeuronPtr> neuronContainer;
                    ConContainerPtr conContainerPtr( new ConContainer() );
                    ConContainerPtr vErased;
                    ConPtr  ptC;
                    NeuronPtr ptN;
                    int ids[]= {11, 10, 9, 3, 4, 5, 6, 7, 8, 2, 1};
                    std::vector<double> nWeights;
                    nWeights.push_back(11.32);
                    nWeights.push_back(1.26);
                    nWeights.push_back(2.14);
                    nWeights.push_back(3.16);
                    nWeights.push_back(4.14);
                    nWeights.push_back(5.19);
                    nWeights.push_back(6.18);
                    nWeights.push_back(7.16);
                    nWeights.push_back(8.14);
                    nWeights.push_back(9.12);
                    nWeights.push_back(10.31);

                    for (int i=0; i<nWeights.size() ; i++) {                                /
  / Let's create a vector with three neurons
                            ptN.reset( new Neuron( ids[i] ) );
                            neuronContainer.push_back(ptN);
                    }
                    conContainerPtr->buildAndAppend(neuronContainer, nWeights
  );

                    // Test

                    std::vector<int> toRemove;
                    toRemove.push_back(1);
                    toRemove.push_back(3);
                    toRemove.push_back(5);
                    toRemove.push_back(7);

                    conContainerPtr->erase(toRemove);
                    conContainerPtr->show();
                    result=conContainerPtr->getId();

            // The output at the R terminal would display :
            //
            // From:         2       Weight=         9.120000
            // From:         4       Weight=         4.140000
            // From:         6       Weight=         6.180000
            // From:         8       Weight=         8.140000
            // From:         9       Weight=         2.140000
            // From:         10   Weight=     1.260000
            // From:         11   Weight=     11.320000
```

See also

select and the unit test files, e.g. runit.Cpp.ConContainer.R, for further examples.

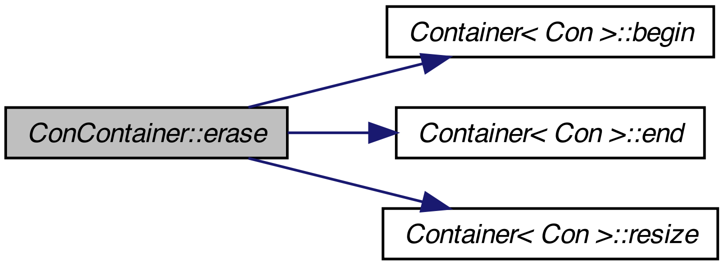
Definition at line 450 of file ConContainer.cpp.

References Container< Con >::begin(), Container< Con >::end(), and Container<

Con >::resize().

```
{
  std::vector<ConPtr>::iterator itr;
  sort(begin(), end(), CompareId());
  sort(nIds.begin(), nIds.end());
  itr = set_difference(begin(), end(), nIds.begin(), nIds.end(), begin(),
      CompareId());
  resize(itr - begin());
}
```

Here is the call graph for this function:



5.3.4.2 std::vector< int > ConContainer::getId ( )

Getter of the Id values of the vector of Cons.

This function returns the Id's of the neurons referred to by the vector of Cons.

Returns

An std::vector<int> that contains the Ids

```
  //================
  //Usage example:
  //================
        // Data set up
                        Neuron N1, N2, N3;
                        ConContainer conContainer;
                        std::vector<int> result;

                        N1.setId(10);
                        N2.setId(20);
                        N3.setId(30);

                        ConPtr ptCon( new Con(&N1, 1.13) );     // Create new Con
```

```
       and initialize ptCon
                        conContainer.push_back(ptCon);                           /
      / push_back
                        ptCon.reset(  new Con(&N2, 2.22) );             // create
       new Con and assign to ptCon
                        conContainer.push_back(ptCon);                           /
      / push_back
                        ptCon.reset(  new Con(&N3, 3.33) );             // create
       new Con and assign to ptCon
                        conContainer.push_back(ptCon);                           /
      / push_back

        // Test
                        conContainer.show() ;
                        conContainer.validate();
                        result=conContainer.getId();

        // Now result is a vector that contains the values 10, 20 and 30.
```

See also

getWeight and the unit test files, e.g. runit.Cpp.ConContainer.R, for further examples.

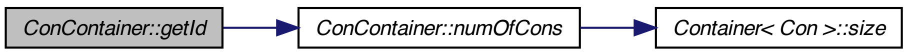
Definition at line 93 of file ConContainer.cpp.

References numOfCons().

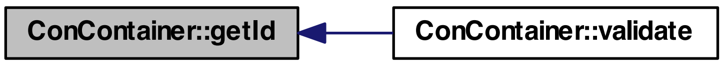
Referenced by validate().

```
{
  std::vector<int> result;
  result.reserve(numOfCons());
  foreach (ConPtr itr, *this)
    {
      result.push_back(itr->getId());
    }
  return result;
}
```

Here is the call graph for this function:



Here is the caller graph for this function:



5.3.4.3 int ConContainer::numOfCons ( )

Size of the ConContainer object.

This function returns the size of the ConContainer object, that is to say, the number of Con objects it contains.

Returns

The size of the vector

```
  //================
  //Usage example:
  //================
        // Data set up
                                std::vector<int> result;
                                std::vector<ConPtr> vcA, vcB;
                                ContainerNeuronPtr      neuronContainerPtr( new
      Container<Neuron>() );
                                ConContainerPtr conContainerPtr( new
      ConContainer() );
                                ConPtr  ptC;
                                NeuronPtr ptN;
                                int ids[]= {10, 20, 30};
                                double weights[] = {1.13, 2.22, 3.33 };
                                for (int i=0; i<=2 ; i++) {                    /
      / Let's create a vector with three neurons
                                        ptN.reset( new Neuron( ids[i] ) );
                                        neuronContainerPtr->push_back(ptN);
                                }
        // Test
                                for (int i=0; i<=2 ; i++) {                    /
      / and a vector with three connections
                                        result.push_back(conContainerPtr->numOfCo
      ns());          // Append numOfCons to result, create new Con and push_back into
      conContainer
                                        ptC.reset( new Con( neuronContainerPtr->l
      oad().at(i), weights[i]) );
                                        conContainerPtr->push_back(ptC);
                                }

        // Now, result contains a numeric vector with values 0, 1, 2, and 3.
```

See also

Container::size (alias)

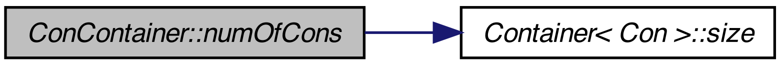
Definition at line 52 of file ConContainer.cpp.

References Container< Con >::size().

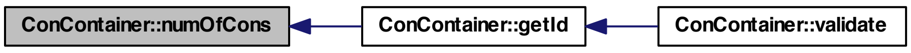
Referenced by getId().

```
{
  return size();
}
```

Here is the call graph for this function:



Here is the caller graph for this function:



5.3.4.4 ConContainerPtr ConContainer::select (std::vector< int > *nIds*)

Selects the specified elements from the vecCom object.

Provides a convenient way of selecting some Con objects from the collection field of the ConContainer object.

Parameters

vFrom	An std::vector<int> with the Ids of the connections to select.

```
        //================
        //Usage example:
```

```
        //================

        // Data set up
                std::vector<int> result;
                std::vector<NeuronPtr> neuronContainer;
                ConContainerPtr conContainerPtr( new ConContainer() );
                ConPtr  ptC;
                NeuronPtr ptN;
                int ids[]= {11, 10, 9, 3, 4, 5, 6, 7, 8, 2, 1};
                double weights[]={11.32, 1.26, 2.14, 3.16, 4.14, 5.19, 6.18, 7.16
      , 8.14, 9.12, 10.31};
                std::vector<double> nWeights;
                for (int i=0; i<11; i++) {
                        nWeights.push_back(weights[i]);
                }
                for (int i=0; i<nWeights.size() ; i++) {                        /
      / Let's create a vector with three neurons
                        ptN.reset( new Neuron( ids[i] ) );
                        neuronContainer.push_back(ptN);
                }
                conContainerPtr->buildAndAppend(neuronContainer, nWeights);
                // Test
                std::vector<int> toSelect;
                toSelect.push_back(1);
                toSelect.push_back(3);
                toSelect.push_back(5);
                toSelect.push_back(7);

                ConContainerPtr  vSelect (  conContainerPtr->select(toSelect)  );

                result=vSelect->getId();

                // Now, result is a numeric vector with the values 1, 3, 5 and 7.
```

See also

erase and the unit test files, e.g. runit.Cpp.ConContainer.R, for further examples.

Definition at line 505 of file ConContainer.cpp.

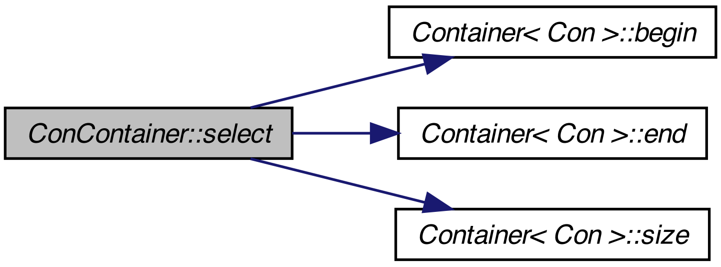
References Container< Con >::begin(), Container< Con >::end(), and Container< Con >::size().

Referenced by setWeight().

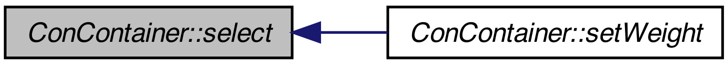
```
{
  ConContainerPtr result(new ConContainer);
  result->reserve(size());
  sort(begin(), end(), CompareId());
  sort(nIds.begin(), nIds.end());
  set_intersection(begin(), end(), nIds.begin(), nIds.end(),
      std::back_inserter(*result), CompareId());

  return result;
}
```

Here is the call graph for this function:



Here is the caller graph for this function:



5.3.4.5 bool ConContainer::setFrom (**NeuronContainer** *neuronContainer*)

Setter of the from fields of the Con objects related to ConContainer.

This function provides a convenient way of getting the values of the weight field of those Con object pointed to by the smart pointer stored in the ConContainer object.

Parameters

vFrom	An std::vector<NeuronPtr> with the pointers to be set in the from fields of the ConContainer object.

Returns

true if not exception is thrown

```
//================
//Usage example:
    //================

    // Data set up
            std::vector<int> result;
            ContainerNeuronPtr      neuronContainerPtr( new
  Container<Neuron>() );
            ConContainerPtr conContainerPtr( new ConContainer() );
            ConPtr  ptC;
            NeuronPtr ptN;

            int ids[]= {10, 20, 30};
            double weights[] = {1.13, 2.22, 3.33 };

            for (int i=0; i<=2 ; i++) {                             // Let's
  create a vector with three neurons
                    ptN.reset( new Neuron( ids[i] ) );
                    neuronContainerPtr->push_back(ptN);
            }
            for (int i=0; i<=2 ; i++) {                             // and a
  vector with three connections
                    ptC.reset( new Con() );
                    conContainerPtr->push_back(ptC);
            }
    // Test
            conContainerPtr->setFrom(neuronContainerPtr->load()) ;
            conContainerPtr->show();
            result=conContainerPtr->getId();

    // Now result is a vector that contains the values 10, 20 and 30.
```

See also

getFrom and the unit test files, e.g. runit.Cpp.ConContainer.R, for further examples.

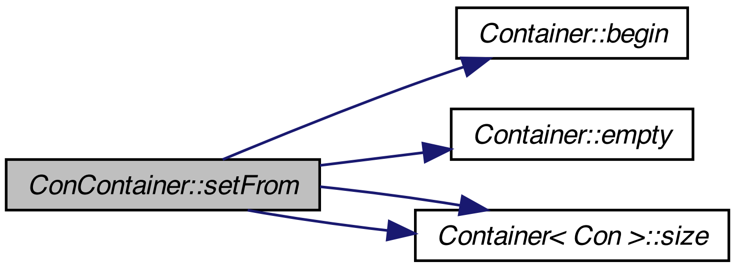
Definition at line 333 of file ConContainer.cpp.

References Container< T >::begin(), Container< T >::empty(), Container< Con >::size(), and Container< T >::size().

```
{
  BEGIN_RCPP
  if (neuronContainer.empty())
    { throw std::range_error("[ C++ ConContainer::setFrom]: Error, w is empty");}

  if (neuronContainer.size() != size())
    {
      throw std::range_error(
          "[C++ ConContainer::setFrom]: Error, neuronContainer.size() != collecti
      on.size()");
    }
  std::vector<NeuronPtr>::iterator itrNeuron = neuronContainer.begin();
  foreach(ConPtr itr , *this)
    {
      itr->setFrom( *itrNeuron );
      itrNeuron++;
    }
  return true;
END_RCPP}
```

Here is the call graph for this function:



5.3.4.6 bool ConContainer::setWeight (std::vector< double > *nWeights*, std::vector< int > *nIds*)

Setter of the weights of the specified elements from the ConContainer object.

Provides a convenient way of setting the weights of some Con objects from the collection field of the ConContainer object.

Parameters

nWeights	A numeric (double) vector with the weights to be set in the Con objects contained in the ConContainer object.
vFrom	An std::vector<int> with the Ids of the connections to select

Returns

true in case no exception is thrown

```
        //================
        //Usage example:
        //================

        // Data set up
                std::vector<double> result;
                        std::vector<NeuronPtr> neuronContainer;
                        ConContainerPtr conContainerPtr( new ConContainer() );
                        ConPtr  ptC;
                        NeuronPtr ptN;
                        int ids[]= {11, 10, 9, 3, 4, 5, 6, 7, 8, 2, 1};
                        double weights[]={11.32, 1.26, 2.14, 3.16, 4.14, 5.19, 6.
18, 7.16, 8.14, 9.12, 10.31};
                        std::vector<double> nWeights;
                        for (int i=0; i<11; i++) {
                        nWeights.push_back(weights[i]);
                        }
                        for (int i=0; i<nWeights.size() ; i++) {
      / Let's create a vector with three neurons
                        ptN.reset( new Neuron( ids[i] ) );
                        neuronContainer.push_back(ptN);
                        }
                        conContainerPtr->buildAndAppend(neuronContainer, nWeights
      );

                        std::vector<int> toSelect;
                        std::vector<double> vNewWeights;
                        toSelect.push_back(1);
                        toSelect.push_back(3);
                        toSelect.push_back(5);
                        toSelect.push_back(7);
                        vNewWeights.push_back(1000.1);
                        vNewWeights.push_back(3000.3);
                        vNewWeights.push_back(5000.5);
                        vNewWeights.push_back(7000.7);
                        conContainerPtr->setWeight(vNewWeights, toSelect);

        // Test
                        result = conContainerPtr->getWeight();
                        return wrap(result);

        // Now, result is a numeric vector with the values  1000.10, 9.12, 3000.3
      0, 4.14, 5000.50, 6.18, 7000.70, 8.14, 2.14, 1.26 and 11.32 .
```

See also

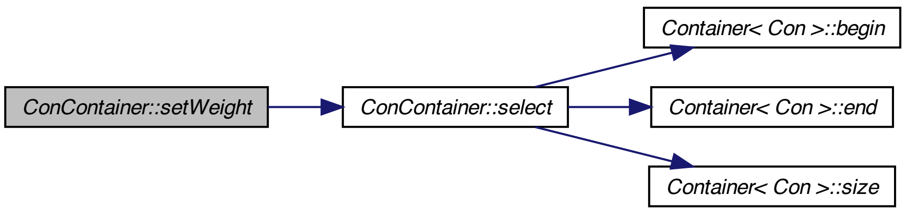
getWeigth and the unit test files, e.g. runit.Cpp.ConContainer.R, for further examples.

Definition at line 627 of file ConContainer.cpp.

References select().

```
{
BEGIN_RCPP return select(nIds)->setWeight(nWeights);
END_RCPP
}
```

Here is the call graph for this function:



5.3.4.7 bool ConContainer::setWeight (std::vector< double > *nWeights*)

Setter of the weight field of the Con objects related to ConContainer.

This function provides a convenient way of setting the values of the weight field of those Con objects pointed to by the smart pointer stored in the ConContainer object.

Parameters

nWeights	A numeric (double) vector with the weights to be set in the Con objects contained in the ConContainer object.

Returns

true in case no exception is thrown

```
//================
//Usage example:
//================
// Data set up
        std::vector<double> result;
                int ids[]= {1, 2, 3};
                double weights[] = {12.3, 1.2, 2.1 };
                ConContainer conContainer;
                std::vector<NeuronPtr> neuronContainer;
                std::vector<double> nWeights;
                NeuronPtr ptNeuron;

                for (int i=0; i<=2; i++) {
                ptNeuron.reset( new Neuron(ids[1]) );
                neuronContainer.push_back(ptNeuron);
                nWeights.push_back(0);                                   /
/ weights are set to 0
                }
                conContainer.buildAndAppend(neuronContainer, nWeights);
                conContainer.show();

                for (int i=0; i<=2; i++) {
                        nWeights.at(i)=weights[i];
                }
// Test
                conContainer.setWeight(nWeights);                        /
/ weights are set to 12.3, 1.2 and 2.1
                result=conContainer.getWeight();

// Now result is a vector that contains the values 12.3, 1.2 and 2.1 .
```

See also

getWeight and the unit test files, e.g. runit.Cpp.ConContainer.R, for further examples.

Definition at line 270 of file ConContainer.cpp.

References Container< Con >::size().

```
{
  BEGIN_RCPP
  if (nWeights.empty())
    { throw std::range_error("[ C++ ConContainer::setWeight]: Error, nWeights is
      empty");}
  if (nWeights.size() != size())
    {
      throw std::range_error(
          "[C++ ConContainer::setWeight]: Error, nWeights.size() != collection.si
      ze()");
    }
  std::vector<double>::iterator itrWeight = nWeights.begin();
  foreach (ConPtr itr, *this)
    {
      itr->setWeight( *itrWeight );
      itrWeight++;
    }
  return true;
END_RCPP}
```

Here is the call graph for this function:

ConContainer::setWeight
Container< Con >::size

5.3.4.8 bool ConContainer::validate ( )

Object validator.

This method checks the object for internal coherence. A try / catch mechanism exits its normal execution and returns control to the R terminal in case the contents of the ConContainer object are identified as corrupted.

Returns

true in case the checks are Ok.

Exceptions

An	std::range error if weight or from are not finite.

See also

The unit test files, e.g., runit.Cpp.ConContainer.R, for usage examples.

Reimplemented from Container< Con >.

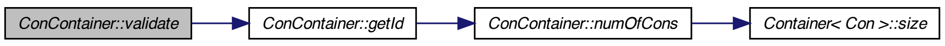
Definition at line 645 of file ConContainer.cpp.

References getId().

```
{
  BEGIN_RCPP

  std::vector<int>::iterator itr;
  std::vector<int> vIds = getId();
  sort(vIds.begin(), vIds.end());
  itr = adjacent_find(vIds.begin(), vIds.end());
  if (itr != vIds.end())
    throw std::range_error(
        "[C++ ConContainer::validate]: Error, duplicated Id.");
  Container<Con>::validate();
  return (true);
END_RCPP};
```

Here is the call graph for this function:



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

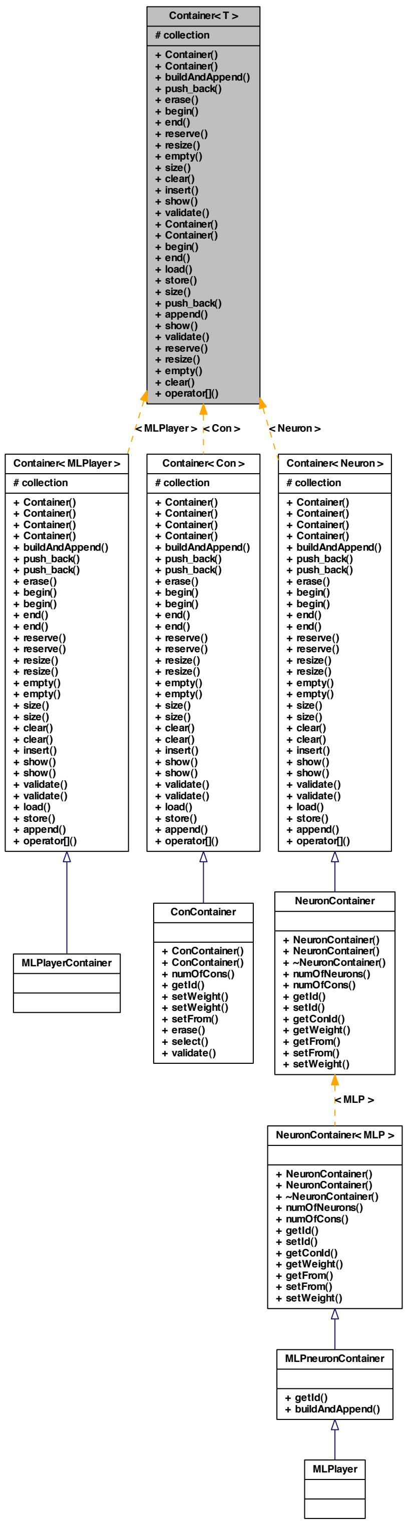
- pkg/AMORE/src/old/ConContainer.h
- pkg/AMORE/src/old/ConContainer.cpp

5.4 Container< T > Class Template Reference

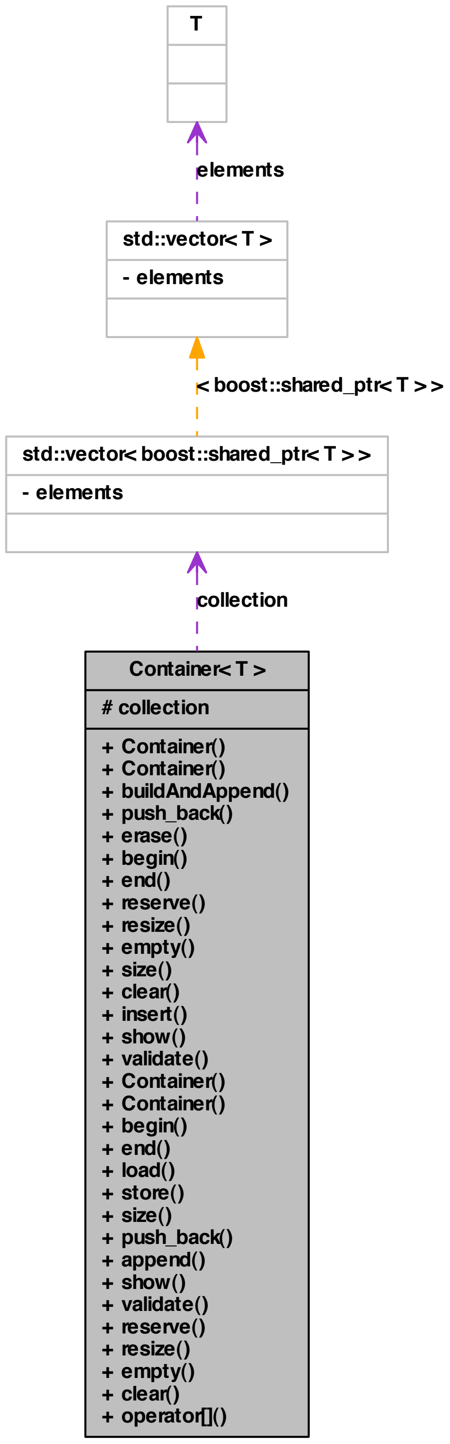
class Container -

`#include <Container.h>`

Inheritance diagram for Container< T >:



Collaboration diagram for Container< T >:



Public Types

- typedef boost::shared_ptr< T > value_type
- typedef boost::shared_ptr< T > const & const_reference
- typedef std::vector< boost::shared_ptr< T > >::iterator iterator
- typedef std::vector< boost::shared_ptr< T > >::const_iterator const_iterator
- typedef std::vector< boost::shared_ptr< T > >::iterator iterator
- typedef std::vector< boost::shared_ptr< T > >::const_iterator const_iterator
- typedef boost::shared_ptr< T > value_type
- typedef value_type const & const_reference

Public Member Functions

- Container ()
- Container (typename std::vector< boost::shared_ptr< T > >::iterator first, typename std::vector< boost::shared_ptr< T > >::iterator last)
- bool buildAndAppend (NeuronContainer_iterator firstNeuron, NeuronContainer_iterator lastNeuron, std::vector< double >::iterator firstWeight, std::vector< double >::iterator lastWeight)
- void push_back (value_type const &const_reference)

  Append a shared_ptr at the end of collection.
- void erase (iterator first, iterator last)
- iterator begin ()
- iterator end ()
- void reserve (int n)
- void resize (int n)
- void empty ()
- size_type size ()

  Returns the size or length of the vector.
- void clear ()
- void insert (iterator position, const_iterator first, const_iterator last)
- void show ()

  Pretty print of the Container< T >
- bool validate ()

  Object validator.
- Container ()
- Container (std::vector< value > first, std::vector< value > last)
- iterator begin ()
- iterator end ()
- std::vector< boost::shared_ptr< T > > load ()

  collection field accessor function
- void store (typename std::vector< boost::shared_ptr< T > > collectionT)

  collection field accessor function
- size_type size ()
- void push_back (boost::shared_ptr< T > const &const_reference)

- void append (Container< T > containerT)

  Appends a Container<T> object.
- bool show ()
- bool validate ()
- void reserve (int n)
- void resize (int n)
- bool empty ()
- void clear ()
- boost::shared_ptr< T > & operator[] (size_type offset)

Protected Attributes

- std::vector< boost::shared_ptr< T > > collection

5.4.1 Detailed Description

template<typename T>class Container< T >

class Container -

Definition at line 13 of file Container.h.

5.4.2 Member Typedef Documentation

5.4.2.1 template<typename T> typedef std::vector<boost::shared_ptr<T> >::const_iterator Container< T >::const_iterator

Reimplemented in ConContainer, and NeuronContainer.

Definition at line 21 of file Container.h.

5.4.2.2 template<typename T> typedef std::vector<boost::shared_ptr<T> >::const_iterator Container< T >::const_iterator

Reimplemented in ConContainer, and NeuronContainer.

Definition at line 22 of file Container.h.

5.4.2.3 template<typename T> typedef boost::shared_ptr<T> const& Container< T >::const_reference

Reimplemented in ConContainer, and NeuronContainer.

Definition at line 18 of file Container.h.

5.4.2.4 template<typename T> typedef value_type const& Container< T >::const_reference

Reimplemented in ConContainer, and NeuronContainer.

Definition at line 26 of file Container.h.

5.4.2.5 template<typename T> typedef std::vector<boost::shared_ptr<T> >::iterator Container< T >::iterator

Reimplemented in ConContainer, and NeuronContainer.

Definition at line 19 of file Container.h.

5.4.2.6 template<typename T> typedef std::vector<boost::shared_ptr<T> >::iterator Container< T >::iterator

Reimplemented in ConContainer, and NeuronContainer.

Definition at line 19 of file Container.h.

5.4.2.7 template<typename T> typedef boost::shared_ptr<T> Container< T >::value_type

Reimplemented in ConContainer, and NeuronContainer.

Definition at line 24 of file Container.h.

5.4.2.8 template<typename T> typedef boost::shared_ptr<T> Container< T >::value_type

Reimplemented in ConContainer, and NeuronContainer.

Definition at line 17 of file Container.h.

5.4.3 Constructor & Destructor Documentation

5.4.3.1 template<typename T > Container< T >::Container ( )

Definition at line 9 of file Container.cpp.

```
{
}
```

5.4.3.2 template<typename T> Container< T >::Container (typename std::vector< boost::shared_ptr< T > >::iterator *first*, typename std::vector< boost::shared_ptr< T > >::iterator *last*)

Definition at line 14 of file Container.cpp.

References Container< T >::collection.

```
                                                                          :
    collection()
  {
    collection.insert(collection.begin(), first, last);
  }
```

5.4.3.3 template<typename T> Container< T >::Container ( )

5.4.3.4 template<typename T> Container< T >::Container (std::vector< value > *first*, std::vector< value > *last*)

5.4.4 Member Function Documentation

5.4.4.1 template<typename T> void Container< T >::append (Container< T > *v*)

Appends a Container<T> object.

This method inserts the collection field of a second object at the end of the collection field of the calling object.

Parameters

v	The Container<T> object to be added to the current one

See also

The unit test files, e.g., runit.Cpp.Container.R, for usage examples.

```
        //================
        //Usage example:
        //================
        // Data set up
                                std::vector<int> result;
                                std::vector<ConPtr> vcA, vcB;
                                ContainerNeuronPtr      neuronContainerPtr( new
      Container<Neuron>() );
                                ContainerConPtr conContainerPtrA( new
      Container<Con>() );
                                ContainerConPtr conContainerPtrB( new
      Container<Con>() );
                                ConPtr  ptC;
                                NeuronPtr ptN;
                                int ids[]= {1, 2, 3, 4, 5, 6};
                                double weights[] = {1.13, 2.22, 3.33, 5.6, 4.2, 3
      .6 };
                                for (int i=0; i<=5 ; i++) {                          /
      / Let's create a vector with six neurons
```

```
                                        ptN.reset( new Neuron( ids[i] ) );
                                        neuronContainerPtr->push_back(ptN);
                                }
                                for (int i=0; i<=2 ; i++) {                           /
/ A vector with three connections
                                        ptC.reset( new Con( neuronContainerPtr->l
oad().at(i), weights[i]) );
                                        conContainerPtrA->push_back(ptC);
                                }
                                for (int i=3; i<=5 ; i++) {                           /
/ Another vector with three connections
                                        ptC.reset( new Con( neuronContainerPtr->l
oad().at(i), weights[i]) );
                                        conContainerPtrB->push_back(ptC);
                                }
  // Test
                                conContainerPtrA->append(*conContainerPtrB);
                                conContainerPtrA->validate();
                                conContainerPtrA->show() ;

  // After execution of the code above, the output at the R terminal would
display:
  //
  //  From:        1       Weight=         1.130000
  //      From:    2       Weight=         2.220000
  //      From:    3       Weight=         3.330000
  //      From:    4       Weight=         5.600000
  //      From:    5       Weight=         4.200000
  //      From:    6       Weight=         3.600000
```

See also

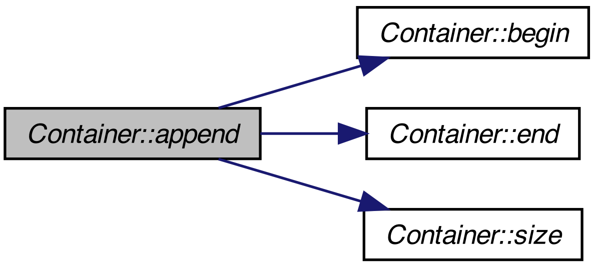
Container::store , Container::push_back and the unit test files, e.g., runit.Cpp.Container.R, for usage examples.

Definition at line 207 of file Container.cpp.

References Container< T >::begin(), Container< T >::end(), and Container< T >::size().

```
{
  reserve(size() + v.size());
  collection.insert(end(), v.begin(), v.end());
}
```

Here is the call graph for this function:



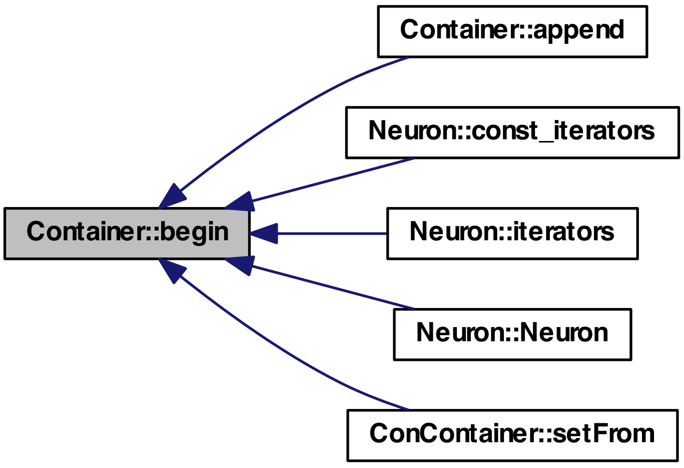
5.4.4.2 template<typename T > std::vector< boost::shared_ptr< T > >::iterator Container< T >::begin ( )

Definition at line 24 of file Container.cpp.

Referenced by Container< T >::append(), Neuron::const_iterators(), Neuron::iterators(), Neuron::Neuron(), and ConContainer::setFrom().

```
{
  return collection.begin();
}
```

Here is the caller graph for this function:



5.4.4.3 template<typename T> iterator Container< T >::begin ( )

5.4.4.4 template<typename T > bool Container< T >::buildAndAppend (NeuronContainer_iterator *firstNeuron*, NeuronContainer_iterator *lastNeuron*, std::vector< double >::iterator *firstWeight*, std::vector< double >::iterator *lastWeight*)

Definition at line 207 of file Container.cpp.

```
{
  BEGIN_RCPP

  bool emptyNeuronContainer = (firstNeuron==lastNeuron);
  if (emptyNeuronContainer)
    {
      throw std::range_error(
          "[ConContainer::BuildAndAppend]: Error, neuronContainer is empty");
    }

  bool differentSize = (lastNeuron - firstNeuron) != (lastWeight - firstWeight);
  if (differentSize)
    {
      throw std::range_error(
          "[ConContainer::buildAndAppend]: Error, neuronContainer.size() != nWeig
      hts.size()");
    }
  reserve(size() + (lastNeuron - firstNeuron));
  ConPtr ptCon;
  while (firstNeuron != lastNeuron)
    {
      ptCon.reset(new Con(*firstNeuron++, *firstWeight++));
      push_back(ptCon);
    }
  return true;
END_RCPP}
```

5.4.4.5 template<typename T > void Container< T >::clear ( )

Definition at line 191 of file Container.cpp.

```
  {
    collection.clear();
  }
```

5.4.4.6 template<typename T> void Container< T >::clear ( )

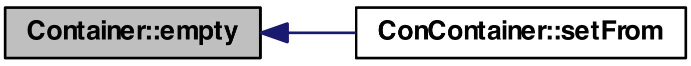
5.4.4.7 template<typename T > bool Container< T >::empty ( )

Definition at line 184 of file Container.cpp.

Referenced by ConContainer::setFrom().

```
  {
    return (collection.empty());
  }
```

Here is the caller graph for this function:



5.4.4.8 template<typename T> bool Container< T >::empty ( )

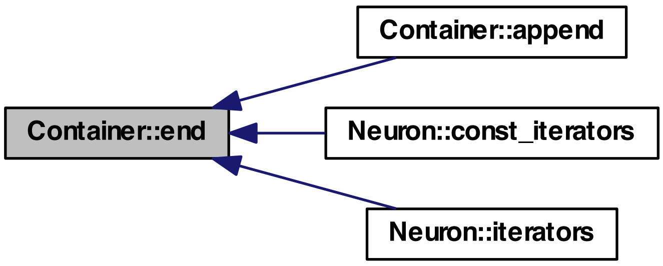
5.4.4.9 template<typename T > std::vector< boost::shared_ptr< T > >::iterator Container< T >::end ( )

Definition at line 31 of file Container.cpp.

Referenced by Container< T >::append(), Neuron::const_iterators(), and Neuron::iterators().

```
{
  return collection.end();
}
```

Here is the caller graph for this function:



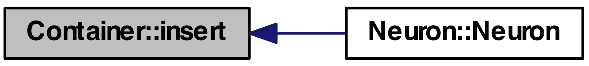
5.4.4.10 template<typename T> iterator Container< T >::end ( )

5.4.4.11 template<typename T> void Container< T >::erase (iterator *first*, iterator *last*)

5.4.4.12 template<typename T> void Container< T >::insert (iterator *position*, const_iterator *first*, const_iterator *last*)

Referenced by Neuron::Neuron().

Here is the caller graph for this function:



5.4.4.13 template<typename T > std::vector< boost::shared_ptr< T > > Container< T >::load ( )

collection field accessor function

This method allows access to the data stored in the collection field.

Returns

The collection vector.

```
    //================
    //Usage example:
    //================
            // Data set up
                          std::vector<int> result;
                          std::vector<ConPtr> vcA, vcB;
                          ContainerNeuronPtr      neuronContainerPtr( new
  Container<Neuron>() );
                          ContainerConPtr conContainerPtr( new
  Container<Con>() );
                          ConPtr  ptC;
                          NeuronPtr ptN;
                          int ids[]= {10, 20, 30};
                          double weights[] = {1.13, 2.22, 3.33 };
                          for (int i=0; i<=2 ; i++) {                          /
  / Let's create a vector with three neurons
                                  ptN.reset( new Neuron( ids[i] ) );
                                  neuronContainerPtr->push_back(ptN);
                          }
                          for (int i=0; i<=2 ; i++) {                          /
  / and a vector with three connections
                                  ptC.reset( new Con( neuronContainerPtr->l
  oad().at(i), weights[i]) );
                                  vcA.push_back(ptC);
                          }
            // Test
                  conContainerPtr->store(vcA);
                  vcB = conContainerPtr->load();
                  for (int i=0; i<=2 ; i++) {                                  /
  / get Ids. Container does not have getId defined
                                  result.push_back( vcB.at(i)->getId());
                  }

            // Now, result is an integer vector with values 10, 20, 30.
```

See also

store and the unit test files, e.g., runit.Cpp.Container.R, for usage examples.

Definition at line 254 of file Container.cpp.

```
{
  return collection;
}
```

5.4.4.14 template<typename T > boost::shared_ptr< T > & Container< T >::operator[] (size_type *offset*)

Definition at line 317 of file Container.cpp.

```
{
  return collection[offset];
}
```

5.4.4.15 template<typename T > void Container< T >::push_back (value_type const & *const_reference*)

Append a shared_ptr at the end of collection.

Implements push_back for the Container class

Parameters

TsharedPtr	A shared_ptr pointer to be inserted at the end of collection

```
                //================
                //Usage example:
                //================
                // Data set up
                        Neuron N1, N2, N3;
                        Container<Con> conContainer;
                        std::vector<ConPtr> vc;
                        std::vector<int> result;
                        N1.setId(10);
                        N2.setId(20);
                        N3.setId(30);
                // Test
                        ConPtr ptCon( new Con(&N1, 1.13) );     // Create new Con
 and initialize ptCon
                        conContainer.push_back(ptCon);                          /
/ push_back
                        ptCon.reset(  new Con(&N2, 2.22) );             // create
 new Con and assign to ptCon
                        conContainer.push_back(ptCon);                          /
/ push_back
                        ptCon.reset(  new Con(&N3, 3.33) );             // create
 new Con and assign to ptCon
                        conContainer.push_back(ptCon);                          /
/ push_back

                        vc = conContainer.load();

                        result.push_back(vc.at(0)->getId());
                        result.push_back(vc.at(1)->getId());
                        result.push_back(vc.at(2)->getId());
  // After execution of this code, result contains a numeric vector with va
lues 10, 20 and 30.
```

See also

C++ documentation for std::vector::push_back and the unit test files, e.g., runit.Cpp.Container.R, for usage examples.

Definition at line 73 of file Container.cpp.

```
  {
    collection.push_back(const_reference);
  }
```

5.4.4.16 template<typename T> void Container< T >::push_back (boost::shared_ptr< T > const & *const_reference*)

5.4.4.17 template<typename T> void Container< T >::reserve (int *n*)

5.4.4.18 template<typename T > void Container< T >::reserve (int *n*)

Definition at line 177 of file Container.cpp.

```
  {
    collection.reserve(n);
  }
```

5.4.4.19 template<typename T> void Container< T >::resize (int *n*)

5.4.4.20 template<typename T > void Container< T >::resize (int *n*)

Definition at line 170 of file Container.cpp.

```
  {
    collection.resize(n);
  }
```

5.4.4.21 template<typename T > bool Container< T >::show ( )

Pretty print of the Container<T>

This method outputs in the R terminal the contents of Container::collection.

Returns

true in case everything works without throwing an exception

*

```
                //================
                //Usage example:
                //================
                // Data set up
                        ContainerNeuronPtr      neuronContainerPtr( new
      Container<Neuron>() );
                        ContainerConPtr conContainerPtr( new Container<Con>() );
                        ConPtr  ptC;
                        NeuronPtr ptN;
                        int ids[]= {10, 20, 30};
                        double weights[] = {1.13, 2.22, 3.33 };

                        for (int i=0; i<=2 ; i++) {                             /
      / Let's create a vector with three neurons
                                ptN.reset( new Neuron( ids[i] ) );
                                neuronContainerPtr->push_back(ptN);
                        }

                        for (int i=0; i<=2 ; i++) {                             /
      / and a vector with three connections
                                ptC.reset( new Con( neuronContainerPtr->load().at
      (i), weights[i]) );
                                conContainerPtr->push_back(ptC);
                        }

                // Test
                        conContainerPtr->show() ;

                // The output at the R terminal would display:
                //
                //      # From:  10      Weight=         1.130000
                //      # From:  20      Weight=         2.220000
                //      # From:  30      Weight=         3.330000
                //
```

See also

The unit test files, e.g., runit.Cpp.Container.R, for usage examples.

Definition at line 124 of file Container.cpp.

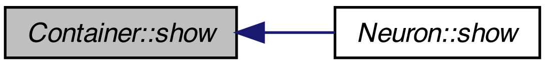
Referenced by Neuron::show().

```
  {

    // This is equivalent to:
    // for( auto x : collection)        { x.show(); }
    // Waiting for C++0x

foreach  (typename boost::shared_ptr<T> itr, *this)
    {
      itr->show();
    }
}
```

Here is the caller graph for this function:



5.4.4.22 template<typename T> bool Container< T >::show ( )

5.4.4.23 template<typename T > size_type Container< T >::size ( )

Returns the size or length of the vector.

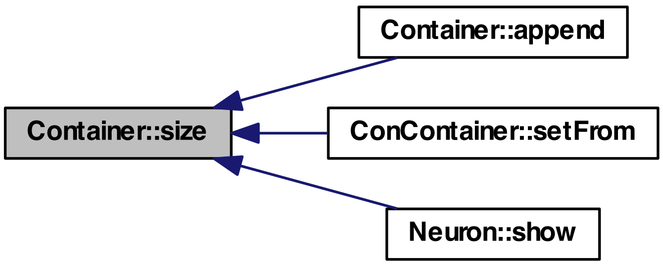
This method returns the size of the vector. In the classes derived from Container<T> this is aliased as numOfCons, numOfNeurons and numOfLayers. The unit test files, e.g., runit.Cpp.Container.R, for usage examples.

Definition at line 162 of file Container.cpp.

Referenced by Container< T >::append(), ConContainer::setFrom(), and Neuron::show().

```
{
  return collection.size();
}
```

Here is the caller graph for this function:



5.4.4.24 template<typename T> size_type Container< T >::size ( )

5.4.4.25 template<typename T> void Container< T >::store (typename std::vector< boost::shared_ptr< T > > *collectionT*)

collection field accessor function

This method sets the value of the data stored in the collection field.

Parameters

v	The vector of smart pointers to be stored in the collection field

See also

load and the unit test files, e.g., runit.Cpp.Container.R, for usage examples.

Definition at line 268 of file Container.cpp.

```
{
  collection = collectionT;
}
```

5.4.4.26 template<typename T > bool Container< T >::validate ( )

Object validator.

This method checks the object for internal coherence. This method calls the validate method for each element in collection,

See also

The unit test files, e.g., runit.Cpp.Container.R, for usage examples.

Reimplemented in ConContainer.

Definition at line 144 of file Container.cpp.

```
{
  foreach (typename boost::shared_ptr<T> itr, *this)
    {
      itr->validate();
    }
  return true;
}
```

5.4.4.27 template<typename T> bool Container< T >::validate ( )

Reimplemented in ConContainer.

5.4.5 Member Data Documentation

5.4.5.1 template<typename T> std::vector< boost::shared_ptr< T > > Container< T >::collection `[protected]`

Definition at line 23 of file Container.h.

Referenced by Container< T >::Container().

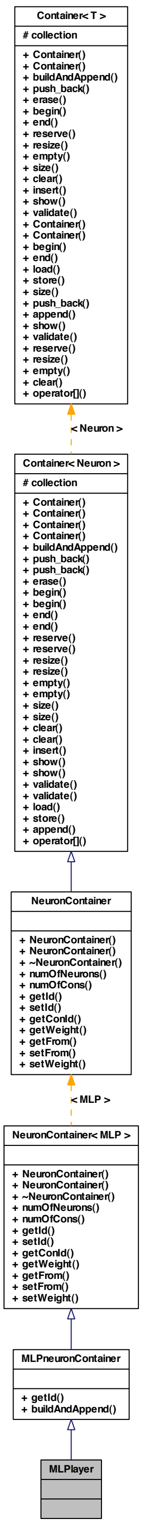
The documentation for this class was generated from the following files:

- pkg/AMORE/src/Container.h
- pkg/AMORE/src/old/Container.h
- pkg/AMORE/src/Container.cpp
- pkg/AMORE/src/old/Container.cpp

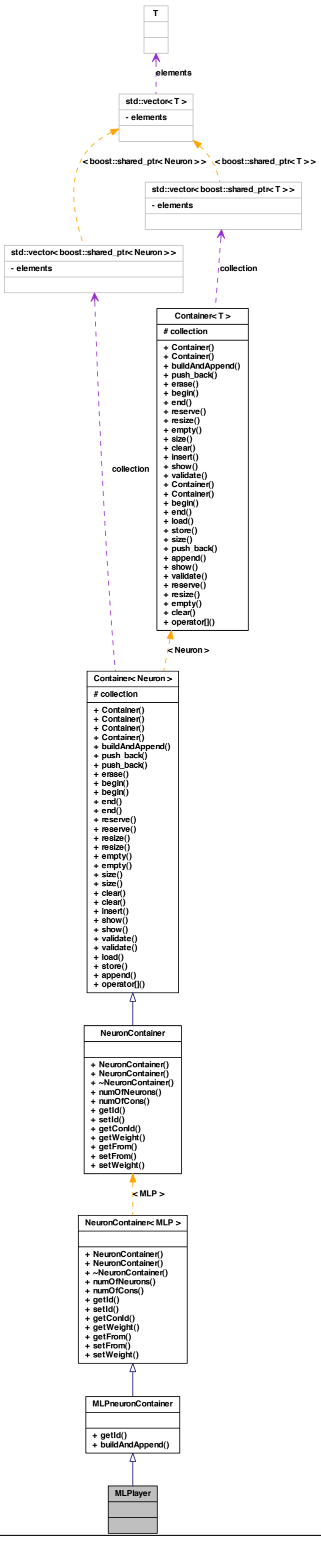
5.5 MLPlayer Class Reference

```
#include <MLPlayer.h>
```

Inheritance diagram for MLPlayer:



Collaboration diagram for MLPlayer:



5.5.1 Detailed Description

Definition at line 1 of file MLPlayer.h.

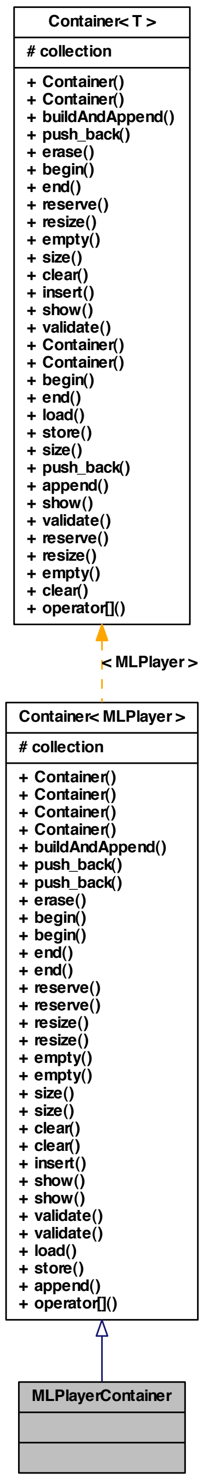
The documentation for this class was generated from the following file:

- pkg/AMORE/src/old/MLPlayer.h

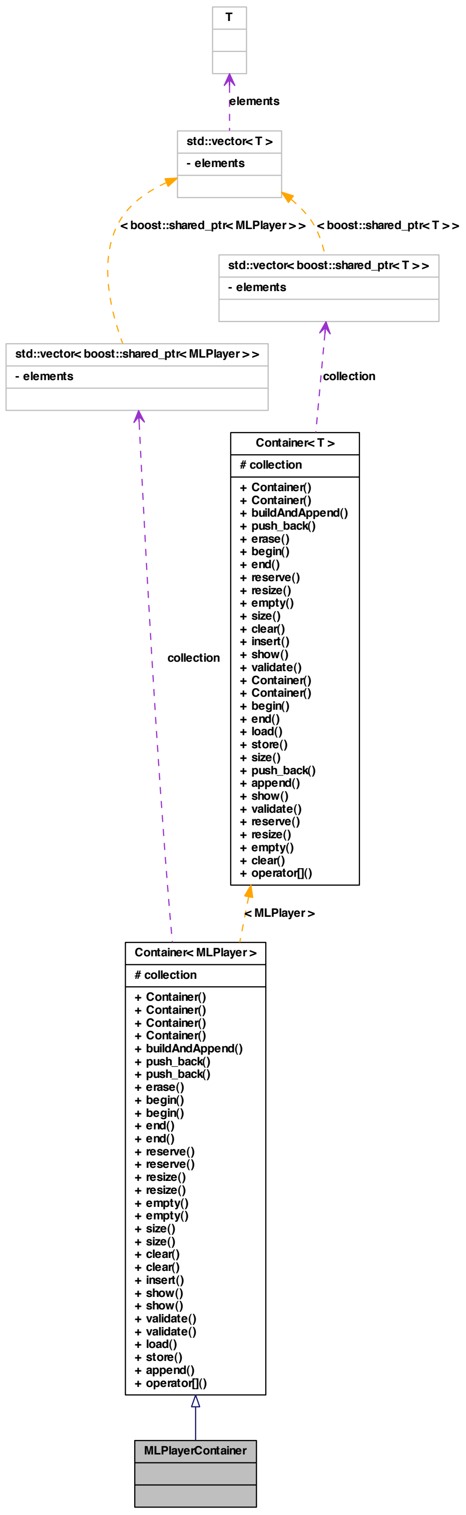
5.6 MLPlayerContainer Class Reference

```
#include <MLPlayerContainer.h>
```

Inheritance diagram for MLPlayerContainer:



Collaboration diagram for MLPlayerContainer:



5.6.1 Detailed Description

Definition at line 1 of file MLPlayerContainer.h.

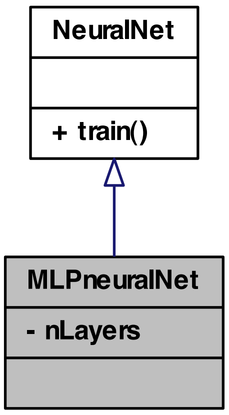
The documentation for this class was generated from the following file:

- pkg/AMORE/src/old/MLPlayerContainer.h

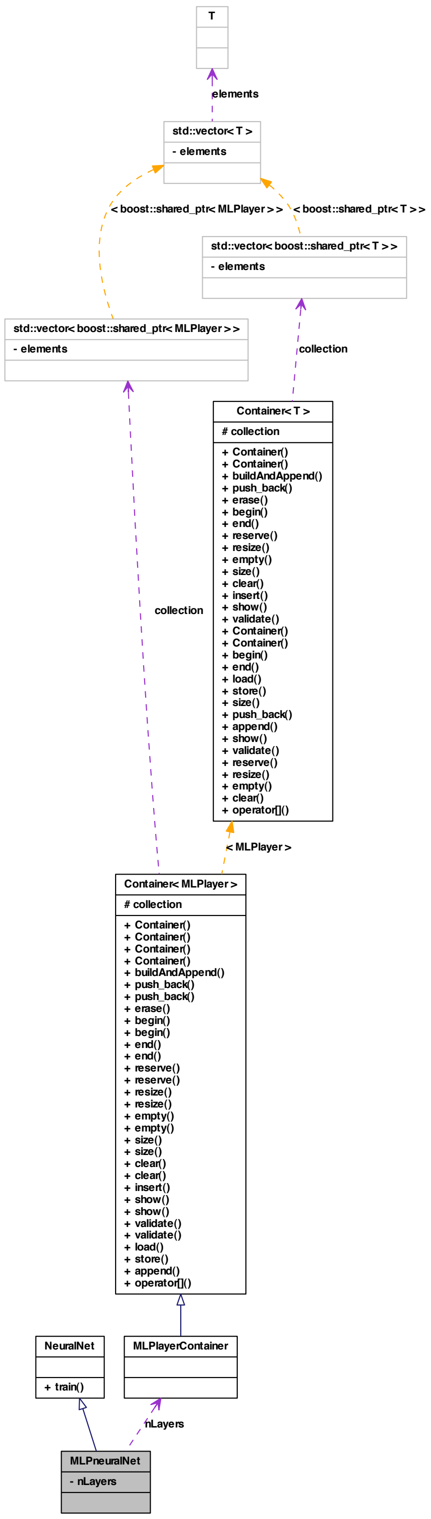
5.7 MLPneuralNet Class Reference

```
#include <MLPneuralNet.h>
```

Inheritance diagram for MLPneuralNet:



Collaboration diagram for MLPneuralNet:



Private Attributes

- MLPlayerContainer nLayers

5.7.1 Detailed Description

Definition at line 1 of file MLPneuralNet.h.

5.7.2 Member Data Documentation

5.7.2.1 MLPlayerContainer MLPneuralNet::nLayers [private]

Definition at line 2 of file MLPneuralNet.h.

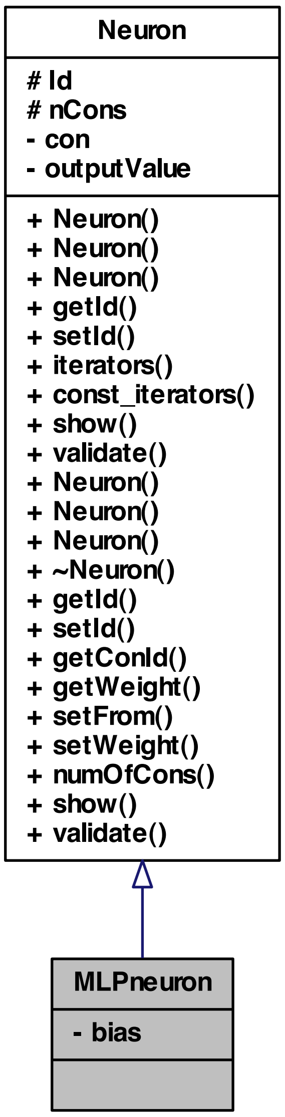
The documentation for this class was generated from the following file:

- pkg/AMORE/src/old/MLPneuralNet.h

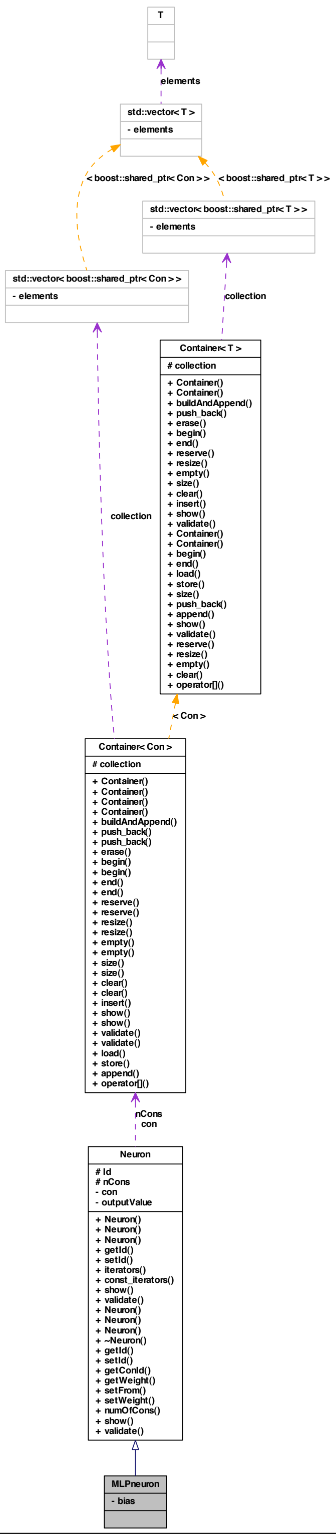
5.8 MLPneuron Class Reference

`#include <MLPneuron.h>`

Inheritance diagram for MLPneuron:



Collaboration diagram for MLPneuron:



Private Attributes

- int bias

5.8.1 Detailed Description

Definition at line 1 of file MLPneuron.h.

5.8.2 Member Data Documentation

5.8.2.1 int MLPneuron::bias `[private]`

Definition at line 2 of file MLPneuron.h.

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

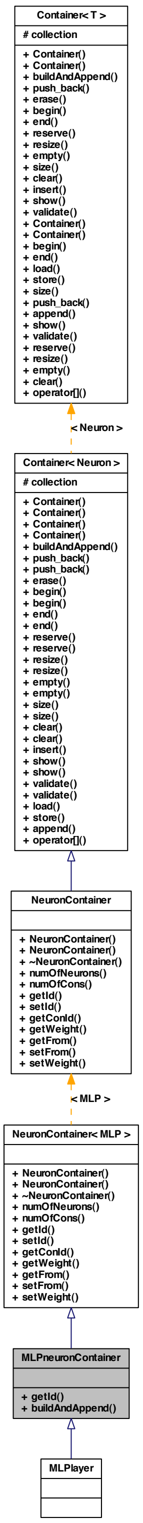
- pkg/AMORE/src/old/MLPneuron.h

5.9 MLPneuronContainer Class Reference

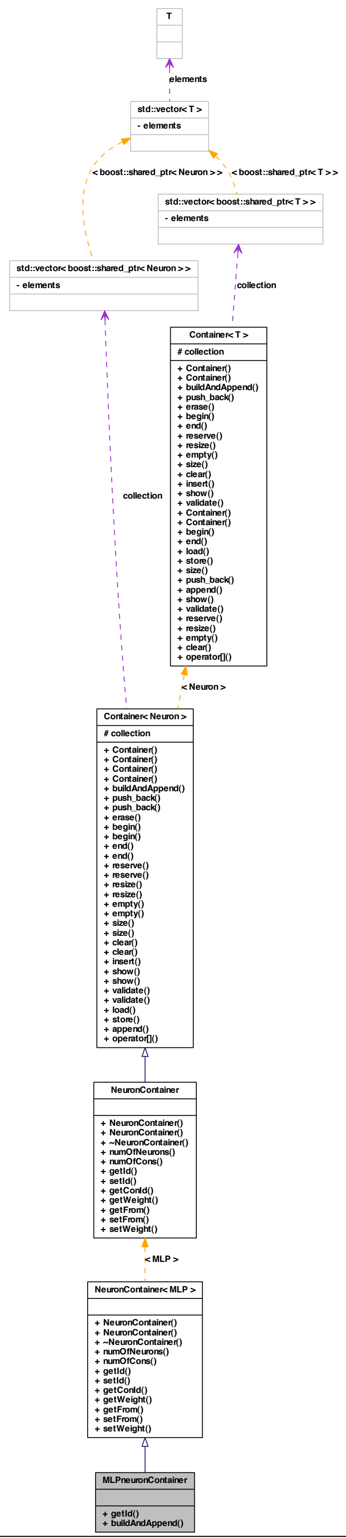
A vector of connections.

```
#include <MLPneuronContainer.h>
```

Inheritance diagram for MLPneuronContainer:



Collaboration diagram for MLPneuronContainer:



Public Member Functions

- std::vector< int > getId ()
- bool buildAndAppend (std::vector< int > IDS, std::vector< int > BIAS, ConContainer VC)

5.9.1 Detailed Description

A vector of connections.

The ConContainer class provides a simple class for a vector of connections. It's named after the R equivalent Reference Class.

Definition at line 16 of file MLPneuronContainer.h.

5.9.2 Member Function Documentation

5.9.2.1 bool MLPneuronContainer::buildAndAppend (std::vector< int > *IDS*, std::vector< int > *BIAS*, ConContainer *VC*)

5.9.2.2 std::vector<int> MLPneuronContainer::getId ( )

Reimplemented from NeuronContainer< MLP >.

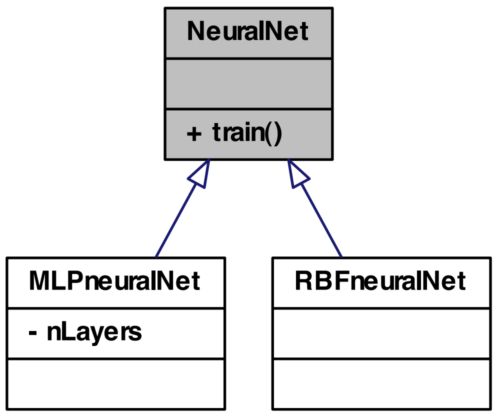
The documentation for this class was generated from the following file:

- pkg/AMORE/src/old/MLPneuronContainer.h

5.10 NeuralNet Class Reference

```
#include <NeuralNet.h>
```

Inheritance diagram for NeuralNet:



Public Member Functions

- virtual void train ()=0

5.10.1 Detailed Description

Definition at line 1 of file NeuralNet.h.

5.10.2 Member Function Documentation

5.10.2.1 virtual void NeuralNet::train ( ) `[pure virtual]`

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

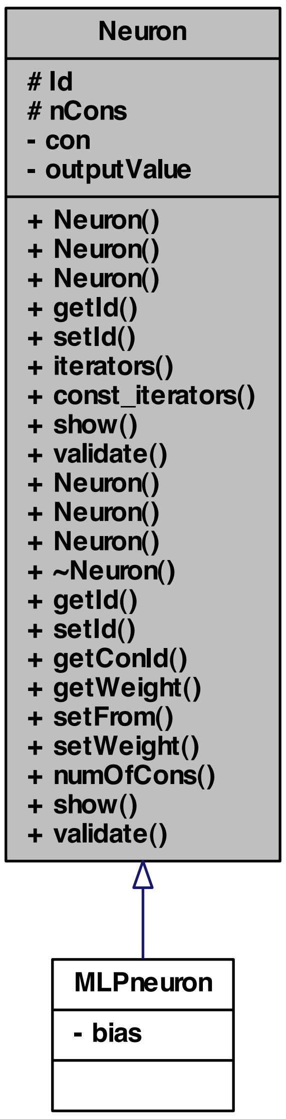
- pkg/AMORE/src/old/NeuralNet.h

5.11 Neuron Class Reference

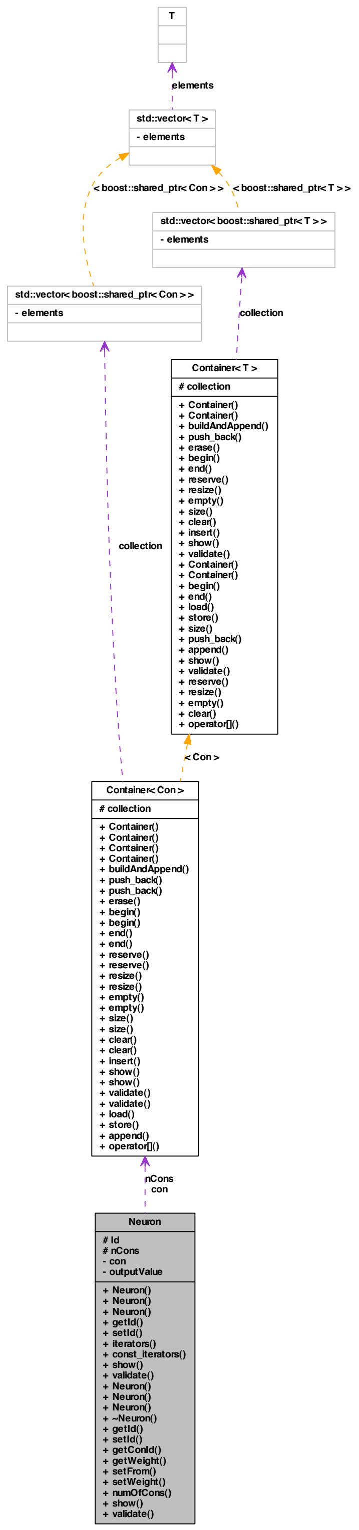
class Neuron -

`#include <Neuron.h>`

Inheritance diagram for Neuron:



Collaboration diagram for Neuron:



Public Member Functions

- Neuron ()
- Neuron (int Id)
- Neuron (int Id, Container< Con >::const_iterator firstCon, Container< Con >::const_-iterator lastCon)
- int getId ()
- void setId (int Id)
- void iterators (Container< Con >::iterator &first, Container< Con >::iterator &last)
- void const_iterators (Container< Con >::const_iterator &first, Container< Con >::const_iterator &last)
- void show ()
- bool validate ()
- Neuron ()
- Neuron (int Id)
- Neuron (int Id, ConContainer con)
- ∼Neuron ()
- int getId ()
- void setId (int value)
- std::vector< int > getConId ()
- std::vector< double > getWeight ()
- bool setFrom (NeuronContainer neuronContainer)
- bool setWeight (std::vector< double > nWeights)
- int numOfCons ()
- bool show ()
- bool validate ()

Protected Attributes

- int Id

    An integer variable with the Neuron Id.
- Container< Con > nCons

Private Attributes

- ConContainer con

    A vector of input connections.
- double outputValue

5.11.1 Detailed Description

class Neuron -

A class to handle the information contained in a general Neuron.

A general class for neurons. The MLPneuron and RBFneuron classes will specialize this general class

Definition at line 5 of file Neuron.h.

5.11.2 Constructor & Destructor Documentation

5.11.2.1 Neuron::Neuron ( )

Definition at line 10 of file Neuron.cpp.

```
                :
  Id(NA_INTEGER), nCons()
{
}
```

5.11.2.2 Neuron::Neuron (int *Id*)

Definition at line 15 of file Neuron.cpp.

```
                      :
  Id(Id), nCons()
{
}
```

5.11.2.3 Neuron::Neuron (int *Id,* Container< Con >::const_iterator *firstCon,* Container< Con >::const_iterator *lastCon*)

Definition at line 20 of file Neuron.cpp.

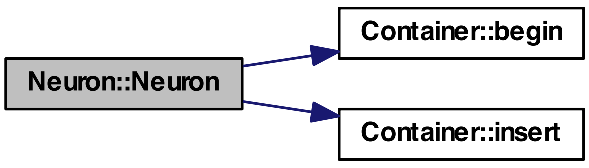
References Container< T >::begin(), Container< T >::insert(), and nCons.

```
                         :
  Id(Id), nCons()
{

  nCons.insert(nCons.begin(), firstCon, lastCon);

}
```

Here is the call graph for this function:



5.11.2.4 Neuron::Neuron ( )

5.11.2.5 Neuron::Neuron (int *Id*)

5.11.2.6 Neuron::Neuron (int *Id*, ConContainer *con*)

5.11.2.7 Neuron::∼Neuron ( )

5.11.3 Member Function Documentation

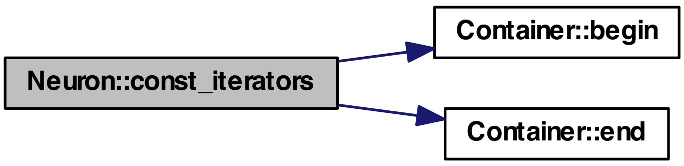
5.11.3.1 void Neuron::const_iterators (Container< Con >::const_iterator & *first*, Container< Con >::const_iterator & *last*)

Definition at line 50 of file Neuron.cpp.

References Container< T >::begin(), Container< T >::end(), and nCons.

```
{
   first=nCons.begin();
    last=nCons.end();
}
```

Here is the call graph for this function:



5.11.3.2 std::vector<int> Neuron::getConId ( )

5.11.3.3 int Neuron::getId ( )

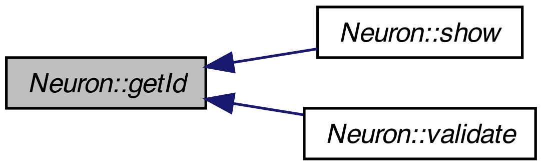
Definition at line 29 of file Neuron.cpp.

References Id.

Referenced by show(), and validate().

```
{
  return Id;
}
```

Here is the caller graph for this function:



5.11.3.4 int Neuron::getId ( )

5.11.3.5 std::vector< double > Neuron::getWeight ( )

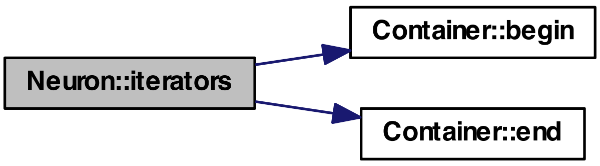
5.11.3.6 void Neuron::iterators (Container< Con >::iterator & *first,* Container< Con >::iterator & *last*)

Definition at line 42 of file Neuron.cpp.

References Container< T >::begin(), Container< T >::end(), and nCons.

```
{
   first=nCons.begin();
    last=nCons.end();
}
```

Here is the call graph for this function:



5.11.3.7 int Neuron::numOfCons ( )

5.11.3.8 bool Neuron::setFrom (NeuronContainer *neuronContainer*)

5.11.3.9 void Neuron::setId (int *Id*)

Definition at line 35 of file Neuron.cpp.

References Id.

```
{
  Id = value;
}
```

5.11.3.10 void Neuron::setId (int *value*)

5.11.3.11 bool Neuron::setWeight (std::vector< double > *nWeights*)

5.11.3.12 bool Neuron::show ( )

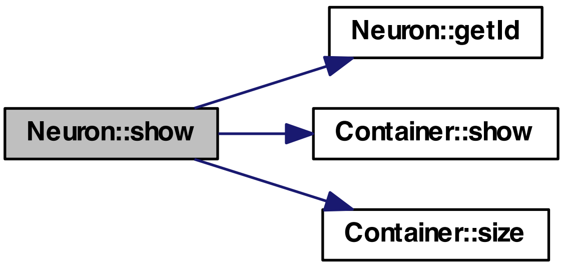
Definition at line 58 of file Neuron.cpp.

References getId(), nCons, Container< T >::show(), and Container< T >::size().

```
{
  int id = getId();
  Rprintf("\n------------------------\n");
  if (id == NA_INTEGER)
    {
      Rprintf("\n Id: NA, Invalid neuron Id");
    }
  else
    {
      Rprintf("\n Id: %d", id);
    }
  Rprintf("\n------------------------\n");

  if (nCons.size() == 0)
    {
      Rprintf("\n No connections defined");
    }
  else
    {
      nCons.show();
    }
  Rprintf("\n------------------------\n");
 }
```

Here is the call graph for this function:



5.11.3.13 bool Neuron::show ( )

5.11.3.14 bool Neuron::validate ( )

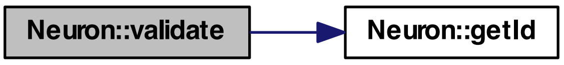
5.11.3.15 bool Neuron::validate ( )

Definition at line 84 of file Neuron.cpp.

References getId().

```
{
  BEGIN_RCPP
  if (getId() == NA_INTEGER ) throw std::range_error("[C++ Neuron::validate]: Err
      or, Id is NA.");
 // nCons.validate();
  return (TRUE);
END_RCPP}
```

Here is the call graph for this function:



5.11.4 Member Data Documentation

5.11.4.1 ConContainer Neuron::con `[private]`

A vector of input connections.

Definition at line 29 of file Neuron.h.

5.11.4.2 int Neuron::Id `[protected]`

An integer variable with the Neuron Id.

The Neuron Id provides a name to the neuron. This value is not expected to be used neither during simulation nor training but it provides an easy reference for human readers.

Definition at line 8 of file Neuron.h.

Referenced by getId(), and setId().

5.11.4.3 Container<Con> Neuron::nCons `[protected]`

Definition at line 9 of file Neuron.h.

Referenced by const_iterators(), iterators(), Neuron(), and show().

5.11.4.4 double Neuron::outputValue `[private]`

Definition at line 30 of file Neuron.h.

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

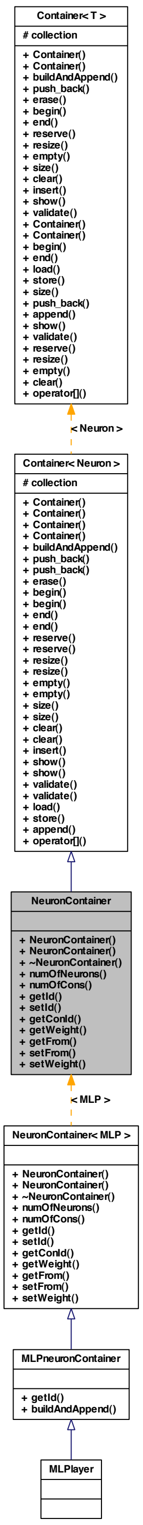
- pkg/AMORE/src/Neuron.h
- pkg/AMORE/src/old/Neuron.h
- pkg/AMORE/src/Neuron.cpp
- pkg/AMORE/src/old/Neuron.cpp

5.12 NeuronContainer Class Reference

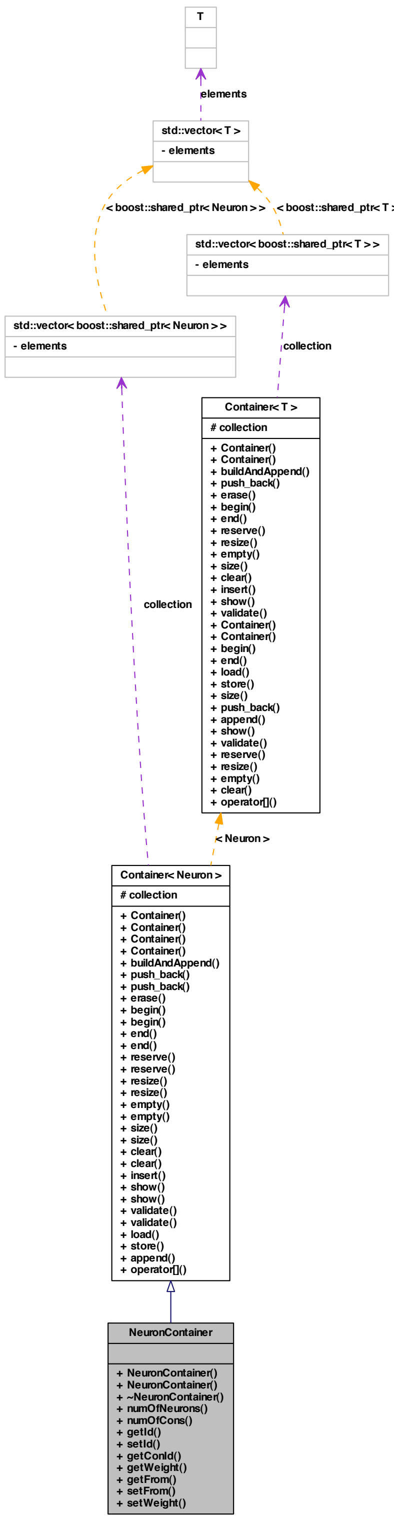
A vector of neurons.

`#include <NeuronContainer.h>`

Inheritance diagram for NeuronContainer:



Collaboration diagram for NeuronContainer:



Public Types

- typedef NeuronContainer_iterator iterator
- typedef NeuronContainer_const_iterator const_iterator
- typedef boost::shared_ptr< Neuron > value_type
- typedef value_type const & const_reference

Public Member Functions

- NeuronContainer ()
- NeuronContainer (std::vector< NeuronPtr > neuronContainer)
- ~NeuronContainer ()
- int numOfNeurons ()
- std::vector< int > numOfCons ()
- std::vector< int > getId ()
- void setId (std::vector< int > nIds)
- std::vector< std::vector< int > > getConId ()
- std::vector< std::vector< double > > getWeight ()
- std::vector< NeuronContainer > getFrom ()
- void setFrom (std::vector< NeuronContainer > neuronArray)
- void setWeight (std::vector< std::vector< double > > value)

5.12.1 Detailed Description

A vector of neurons.

The vecNeuron class provides a simple class for a vector of neurons. It's named after the R equivalent Reference Class.

Definition at line 17 of file NeuronContainer.h.

5.12.2 Member Typedef Documentation

5.12.2.1 typedef NeuronContainer_const_iterator NeuronContainer::const_iterator

Reimplemented from Container< Neuron >.

Definition at line 23 of file NeuronContainer.h.

5.12.2.2 typedef value_type const& NeuronContainer::const_reference

Reimplemented from Container< Neuron >.

Definition at line 27 of file NeuronContainer.h.

5.12.2.3 typedef NeuronContainer_iterator NeuronContainer::iterator

Reimplemented from Container< Neuron >.

Definition at line 21 of file NeuronContainer.h.

5.12.2.4 typedef boost::shared_ptr<Neuron> NeuronContainer::value_type

Reimplemented from Container< Neuron >.

Definition at line 25 of file NeuronContainer.h.

5.12.3 Constructor & Destructor Documentation

5.12.3.1 NeuronContainer::NeuronContainer ( )

Definition at line 8 of file NeuronContainer.cpp.

```
{
}
```

5.12.3.2 NeuronContainer::NeuronContainer (std::vector< NeuronPtr > *neuronContainer*)

Definition at line 12 of file NeuronContainer.cpp.

```
                                                                        :
  Container<Neuron> (collection)
{
}
```

5.12.3.3 NeuronContainer::∼NeuronContainer ( )

Definition at line 17 of file NeuronContainer.cpp.

```
{
}
```

5.12.4 Member Function Documentation

5.12.4.1 std::vector< std::vector< int > > NeuronContainer::getConId ( )

Definition at line 60 of file NeuronContainer.cpp.

```
{
  std::vector < std::vector<int> > result;
  foreach(NeuronPtr itrNeuron, *this)
```

```
    {
      result.push_back( itrNeuron->getConId() );
    }
  return result;
}
```

5.12.4.2 std::vector<NeuronContainer> NeuronContainer::getFrom ( )

5.12.4.3 std::vector< int > NeuronContainer::getId ( )

Reimplemented in MLPneuronContainer.

Definition at line 39 of file NeuronContainer.cpp.

```
{
  std::vector<int> nIds;
  foreach(NeuronPtr itrNeuron, *this)
    {
      nIds.push_back( itrNeuron->getId() );
    }
  return nIds;
}
```

5.12.4.4 std::vector< std::vector< double > > NeuronContainer::getWeight ( )

Definition at line 71 of file NeuronContainer.cpp.

```
{
  std::vector < std::vector<double> > result;
  foreach(NeuronPtr itrNeuron, *this)
    {
      result.push_back( itrNeuron->getWeight() );
    }
  return result;
}
```

5.12.4.5 std::vector< int > NeuronContainer::numOfCons ( )

Definition at line 28 of file NeuronContainer.cpp.

```
{
  std::vector<int> nIds;
  foreach(NeuronPtr itrNeuron, *this)
    {
      nIds.push_back( itrNeuron->numOfCons() );
    }
  return nIds;
}
```

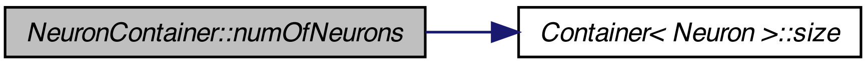
5.12.4.6 int NeuronContainer::numOfNeurons ( )

Definition at line 22 of file NeuronContainer.cpp.

References Container< Neuron >::size().

```
{
  size();
}
```

Here is the call graph for this function:



5.12.4.7 void NeuronContainer::setFrom (std::vector< NeuronContainer > *neuronArray*)

Definition at line 83 of file NeuronContainer.cpp.

```
{
  std::vector<NeuronContainer>::iterator itrArray(neuronArray.begin());
foreach(NeuronPtr itrNeuron, *this)
  {
    itrNeuron->setFrom(*itrArray);
    itrArray++;
  }
}
```

5.12.4.8 void NeuronContainer::setId (std::vector< int > *nIds*)

Definition at line 50 of file NeuronContainer.cpp.

```
{
  std::vector<int>::iterator itrId(nIds.begin());
foreach(NeuronPtr itrNeuron, *this)
  {
    itrNeuron->setId(*itrId);
  }
}
```

5.12.4.9 void NeuronContainer::setWeight (std::vector< std::vector< double > > *value*)

Definition at line 94 of file NeuronContainer.cpp.

```
{
  std::vector<std::vector<double> >::iterator itrValue(value.begin());
foreach(NeuronPtr itrNeuron, *this)
  {
    itrNeuron->setWeight(*itrValue);
    itrValue++;
  }
}
```

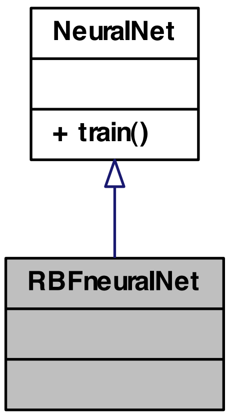
The documentation for this class was generated from the following files:

- pkg/AMORE/src/old/NeuronContainer.h
- pkg/AMORE/src/old/NeuronContainer.cpp

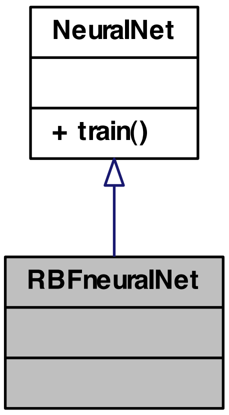
5.13 RBFneuralNet Class Reference

`#include <RBFneuralNet.h>`

Inheritance diagram for RBFneuralNet:



Collaboration diagram for RBFneuralNet:



5.13.1 Detailed Description

Definition at line 1 of file RBFneuralNet.h.

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

- pkg/AMORE/src/old/RBFneuralNet.h

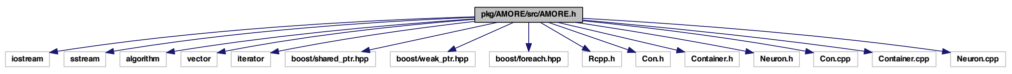
Chapter 6

File Documentation

6.1 pkg/AMORE/src/AMORE.h File Reference

```
#include <iostream>
#include <sstream>
#include <algorithm>
#include <vector>
#include <iterator>
#include <boost/shared_ptr.hpp>
#include <boost/weak_ptr.hpp>
#include <boost/foreach.hpp>
#include <Rcpp.h>
#include "Con.h"
#include "Container.h"
#include "Neuron.h"
#include "Con.cpp"
#include "Container.cpp"
#include "Neuron.cpp"
```

Include dependency graph for AMORE.h:



Defines

- #define foreach BOOST_FOREACH
- #define size_type unsigned int

Typedefs

- typedef boost::shared_ptr< Con > ConPtr
- typedef boost::shared_ptr< Neuron > NeuronPtr
- typedef boost::weak_ptr< Neuron > NeuronWeakPtr
- typedef Container< Con > ConContainer
- typedef Container< Neuron > NeuronContainer
- typedef boost::shared_ptr< ConContainer > ConContainerPtr
- typedef boost::shared_ptr< NeuronContainer > NeuronContainerPtr
- typedef std::vector< boost::shared_ptr< Con > >::iterator ConContainer_iterator
- typedef std::vector< boost::shared_ptr< Con > >::const_iterator ConContainer_-const_iterator
- typedef std::vector< boost::shared_ptr< Neuron > >::iterator NeuronContainer_-iterator
- typedef std::vector< boost::shared_ptr< Neuron > >::const_iterator NeuronContainer_-const_iterator

6.1.1 Define Documentation

6.1.1.1 #define foreach BOOST_FOREACH

Definition at line 49 of file AMORE.h.

6.1.1.2 #define size_type unsigned int

Definition at line 52 of file AMORE.h.

6.1.2 Typedef Documentation

6.1.2.1 typedef **Container**<**Con**> **ConContainer**

Definition at line 59 of file AMORE.h.

6.1.2.2 typedef std::vector<boost::shared_ptr<**Con**> >::const_iterator **ConContainer_const_iterator**

Definition at line 66 of file AMORE.h.

6.1.2.3 typedef std::vector<boost::shared_ptr<Con> >::iterator ConContainer_iterator

Definition at line 65 of file AMORE.h.

6.1.2.4 typedef boost::shared_ptr< ConContainer > ConContainerPtr

Definition at line 62 of file AMORE.h.

6.1.2.5 typedef boost::shared_ptr< Con > ConPtr

Definition at line 55 of file AMORE.h.

6.1.2.6 typedef Container<Neuron> NeuronContainer

Definition at line 60 of file AMORE.h.

6.1.2.7 typedef std::vector<boost::shared_ptr<Neuron> >::const_iterator NeuronContainer_const_iterator

Definition at line 68 of file AMORE.h.

6.1.2.8 typedef std::vector<boost::shared_ptr<Neuron> >::iterator NeuronContainer_iterator

Definition at line 67 of file AMORE.h.

6.1.2.9 typedef boost::shared_ptr< NeuronContainer > NeuronContainerPtr

Definition at line 63 of file AMORE.h.

6.1.2.10 typedef boost::shared_ptr< Neuron > NeuronPtr

Definition at line 56 of file AMORE.h.

6.1.2.11 typedef boost::weak_ptr< Neuron > NeuronWeakPtr

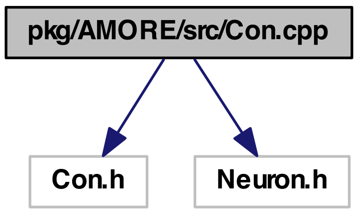
Definition at line 57 of file AMORE.h.

6.2 pkg/AMORE/src/Con.cpp File Reference

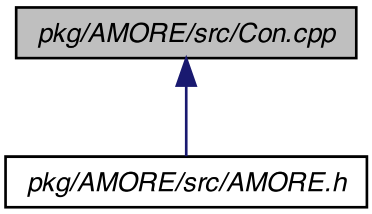
```
#include "Con.h"
```

```
#include "Neuron.h"
```

Include dependency graph for Con.cpp:



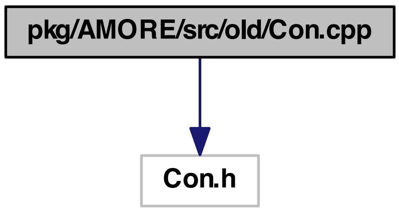
This graph shows which files directly or indirectly include this file:



6.3 pkg/AMORE/src/old/Con.cpp File Reference

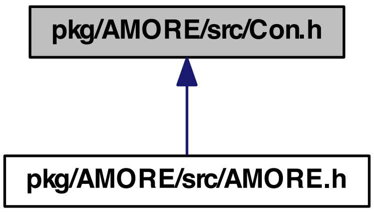
```
#include "Con.h"
```

Include dependency graph for Con.cpp:



6.4 pkg/AMORE/src/Con.h File Reference

This graph shows which files directly or indirectly include this file:



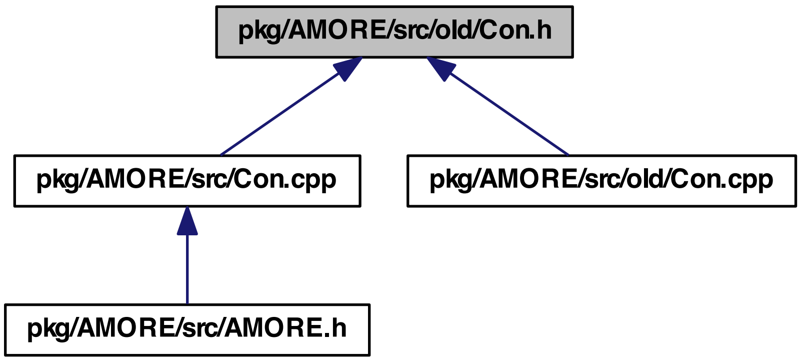
Classes

- class Con

  A class to handle the information needed to describe an input connection.

6.5 pkg/AMORE/src/old/Con.h File Reference

This graph shows which files directly or indirectly include this file:



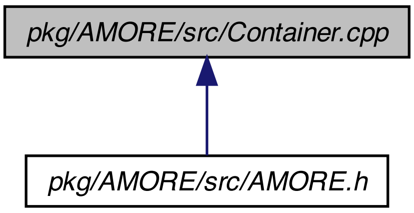
Classes

- class Con

  A class to handle the information needed to describe an input connection.

6.6 pkg/AMORE/src/Container.cpp File Reference

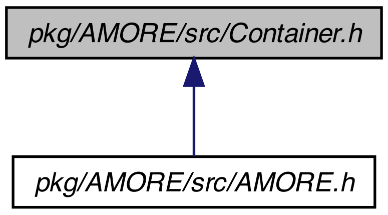
This graph shows which files directly or indirectly include this file:



6.7 pkg/AMORE/src/old/Container.cpp File Reference

6.8 pkg/AMORE/src/Container.h File Reference

This graph shows which files directly or indirectly include this file:



Classes

- class Container< T >

  class Container -

6.9 pkg/AMORE/src/old/Container.h File Reference

Classes

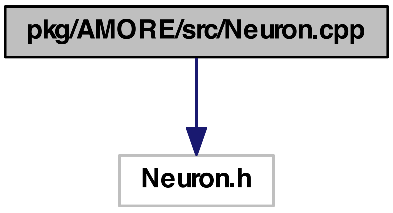
- class Container< T >

  class Container -

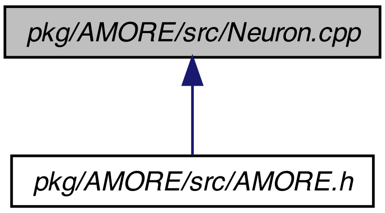
6.10 pkg/AMORE/src/Neuron.cpp File Reference

```
#include "Neuron.h"
```

Include dependency graph for Neuron.cpp:



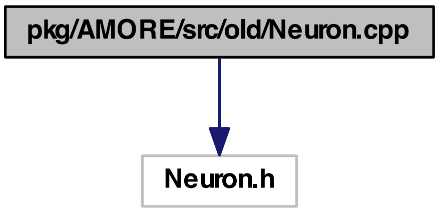
This graph shows which files directly or indirectly include this file:



6.11 pkg/AMORE/src/old/Neuron.cpp File Reference

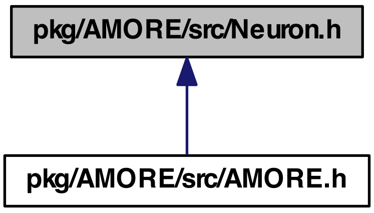
```
#include "Neuron.h"
```

Include dependency graph for Neuron.cpp:



6.12 pkg/AMORE/src/Neuron.h File Reference

This graph shows which files directly or indirectly include this file:



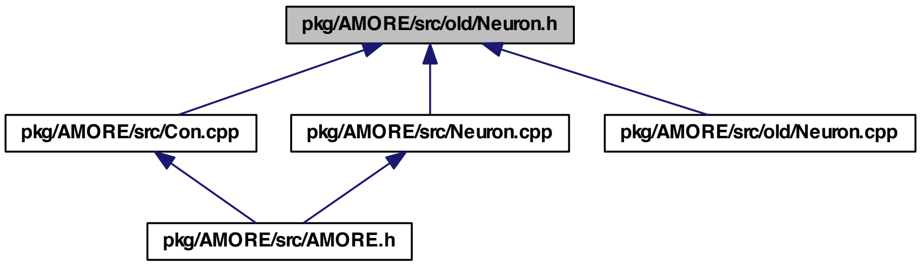
Classes

- class Neuron

  class Neuron -

6.13 pkg/AMORE/src/old/Neuron.h File Reference

This graph shows which files directly or indirectly include this file:



Classes

- class Neuron

  class Neuron -

6.14 pkg/AMORE/src/old/ConContainer.cpp File Reference

Classes

- struct CompareId

6.15 pkg/AMORE/src/old/ConContainer.h File Reference

Classes

- class ConContainer

  A vector of connections.

6.16 pkg/AMORE/src/old/MLPlayer.h File Reference

Classes

- class MLPlayer

6.17 pkg/AMORE/src/old/MLPlayerContainer.h File Reference

Classes

- class MLPlayerContainer

6.18 pkg/AMORE/src/old/MLPneuralNet.h File Reference

Classes

- class MLPneuralNet

6.19 pkg/AMORE/src/old/MLPneuralNetFactory.cpp File Reference

Functions

- MLPneuralNet CreateMLPneuralNet (std::vector< int > numberOfNeuronsPer-Layer)

6.19.1 Function Documentation

6.19.1.1 MLPneuralNet CreateMLPneuralNet (std::vector< int > *numberOfNeuronsPerLayer*)

Definition at line 2 of file MLPneuralNetFactory.cpp.

```
{

  net = new MLPNeuralNet();

  MLPlayerPtr mlpLayerPtr;

  std::vector<int> idx;

foreach (int n, numberOfNeuronsPerLayer)
  {
    for (int i=1; i<=n; ++i)
      {
        idx.push_back(i);
      }
    mlpLayerPtr.reset(new MLPlayer( idx ) );
    net.nLayers.push_back(mlpLayerPtr);
  }



for (int i=1; i<=; ++i)
  {
    mlpPtr->buildAndAppend();
  }
}
```

6.20 pkg/AMORE/src/old/MLPneuron.h File Reference

Classes

- class MLPneuron

6.21 pkg/AMORE/src/old/MLPneuronContainer.h File Reference

Classes

- class MLPneuronContainer

  A vector of connections.

6.22 pkg/AMORE/src/old/NeuralNet.h File Reference

Classes

- class NeuralNet

6.23 pkg/AMORE/src/old/NeuronContainer.cpp File Reference

6.24 pkg/AMORE/src/old/NeuronContainer.h File Reference

Classes

- class NeuronContainer

  A vector of neurons.

6.25 pkg/AMORE/src/old/RBFneuralNet.h File Reference

Classes

- class RBFneuralNet

Index