AMORE++

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

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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 369 of file VecCon.cpp.

5.1.2 Member Function Documentation

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

Definition at line 371 of file VecCon.cpp.

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

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

Definition at line 383 of file VecCon.cpp.

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

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

Definition at line 379 of file VecCon.cpp.

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

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

Definition at line 375 of file VecCon.cpp.

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

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

- pkg/AMORE/src/VecCon.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 f)
  Constructor.
- Con (NeuronPtr f, double w)
  Constructor.
- ~Con ()
  Default Destructor.
- NeuronPtr getFrom ()
  from field accessor.
- void setFrom (NeuronPtr f)
  from field accessor.
- int getId ()
  A getter of the Id of the Neuron pointed by the from field.
- double getWeight ()
  weight field accessor.

- void setWeight (double w)

  weight field accessor.
- bool show ()

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

  Object validator.

Private 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 16 of file Con.h.

5.2.2 Constructor & Destructor Documentation

5.2.2.1 Con::Con ( )

Default Constructor.

Definition at line 18 of file Con.cpp.

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

5.2.2.2 Con::Con (NeuronPtr *f*)

Constructor.

Definition at line 36 of file Con.cpp.

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

5.2.2.3 Con::Con (NeuronPtr *f*, double *w*)

Constructor.

Definition at line 28 of file Con.cpp.

```
: from(f), weight(w) {};
```

5.2.2.4 Con::∼Con ( )

Default Destructor.

Definition at line 41 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 65 of file Con.cpp.

References from.

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

5.2.3.2 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
   Id is set to 16
                    ConPtr ptShCon( new Con(ptShNeuron) );          // from p
  oints 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.

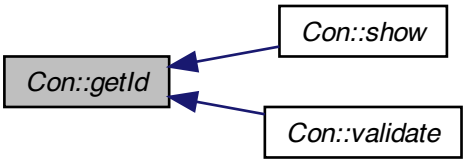
Definition at line 117 of file Con.cpp.

References from.

Referenced by show(), and validate().

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

Here is the caller graph for this function:



5.2.3.3 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.

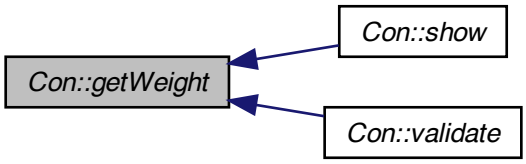
Definition at line 151 of file Con.cpp.

References weight.

Referenced by show(), and validate().

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

Here is the caller graph for this function:



5.2.3.4 void Con::setFrom (NeuronPtr *f*)

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 92 of file Con.cpp.

References from.

```
                                          {
        from=f;
}
```

5.2.3.5 void Con::setWeight (double *w*)

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 180 of file Con.cpp.

References weight.

```
                                    {
  weight = w;
}
```

5.2.3.6 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

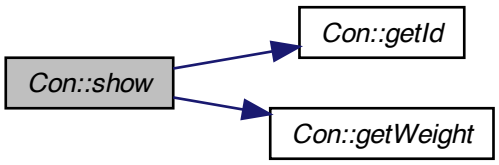
setWeight and the unit test files, e.g., runit.Cpp.Con.R, for usage examples.

Definition at line 192 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());
  }
  return(true);
}
```

Here is the call graph for this function:



5.2.3.7 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

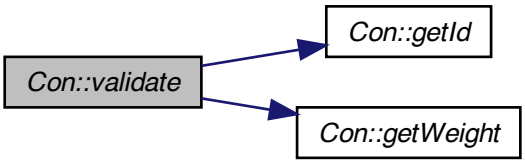
An	std::range error if weight or from are not finite.

Definition at line 211 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:



5.2.4 Member Data Documentation

5.2.4.1 NeuronWeakPtr Con::from [private]

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 21 of file Con.h.

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

5.2.4.2 double Con::weight [private]

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 26 of file Con.h.

Referenced by getWeight(), and setWeight().

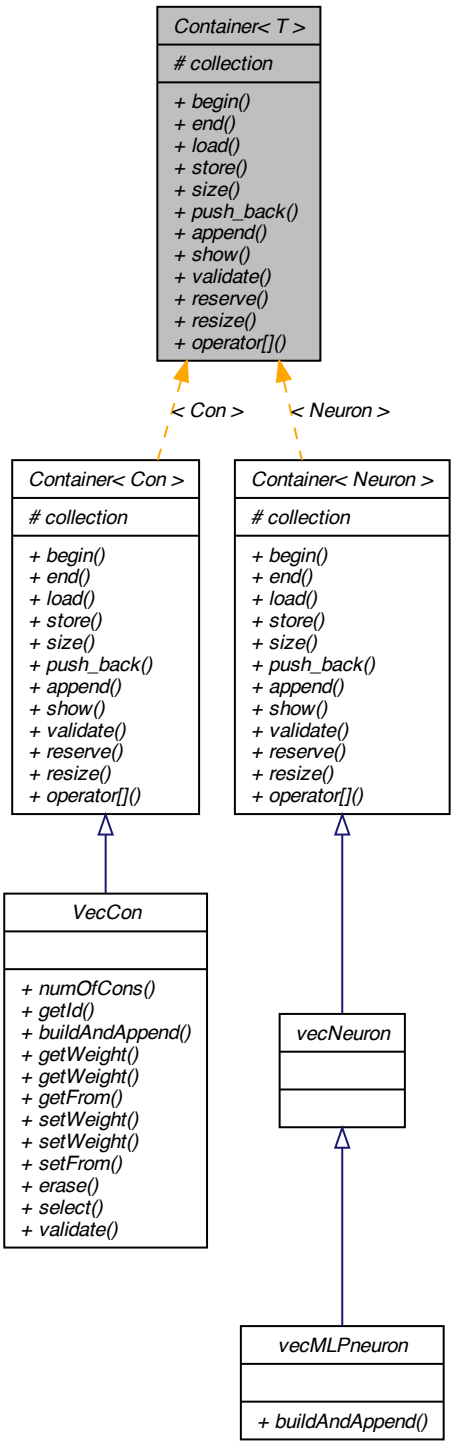
The documentation for this class was generated from the following files:

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

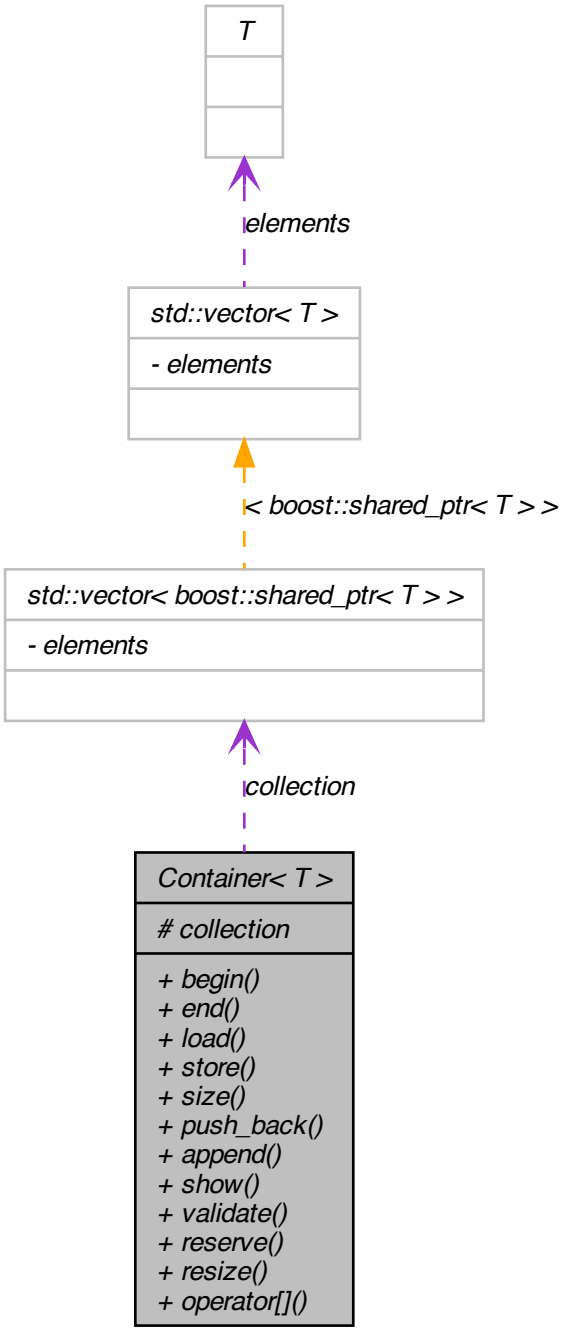
5.3 Container< T > Class Template Reference

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

Inheritance diagram for Container< T >:



Collaboration diagram for Container< T >:



Public Types

- typedef std::vector< boost::shared_ptr< T > >::iterator iterator
- typedef std::vector< boost::shared_ptr< T > >::const_iterator const_iterator

Public Member Functions

- iterator begin ()
- iterator end ()
- std::vector< boost::shared_ptr< T > > load ()

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

  collection field accessor function
- size_type size ()

  Returns the size or length of the vector.
- void push_back (boost::shared_ptr< T > element)

  Append a shared_ptr at the end of collection.
- void append (Container< T > v)

  Appends a Container<T> object.
- bool show ()

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

  Object validator.
- void reserve (int n)
- void resize (int n)
- boost::shared_ptr< T > & operator[] (size_type offset)

Protected Attributes

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

5.3.1 Detailed Description

template<typename T>class Container< T >

Definition at line 12 of file Container.h.

5.3.2 Member Typedef Documentation

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

Definition at line 19 of file Container.h.

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

Definition at line 18 of file Container.h.

5.3.3 Member Function Documentation

5.3.3.1 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      ptShvNeuron( new
Container<Neuron>() );
                          ContainerConPtr ptShvConA( new Container<Con>() )
;
                          ContainerConPtr ptShvConB( 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] ) );
                                  ptShvNeuron->push_back(ptN);
                          }
                          for (int i=0; i<=2 ; i++) {                          /
/ A vector with three connections
                                  ptC.reset( new Con( ptShvNeuron->load().a
t(i), weights[i]) );
                                  ptShvConA->push_back(ptC);
                          }
                          for (int i=3; i<=5 ; i++) {                          /
/ Another vector with three connections
                                  ptC.reset( new Con( ptShvNeuron->load().a
t(i), weights[i]) );
                                  ptShvConB->push_back(ptC);
                          }
  // Test
                          ptShvConA->append(*ptShvConB);
```

```
                                ptShvConA->validate();
                                ptShvConA->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

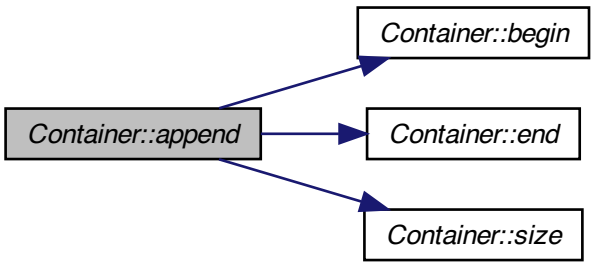
Container::store , Container::push_back and the unit test files, e.g., runit.Cpp.Container.R, for usage examples.

Definition at line 172 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:



5.3.3.2 template<typename T> iterator Container< T >::begin ( ) [inline]

Definition at line 21 of file Container.h.

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

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

Here is the caller graph for this function:

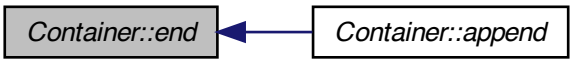
5.3.3.3 template<typename T> iterator Container< T >::end ( ) [inline]

Definition at line 22 of file Container.h.

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

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

Here is the caller graph for this function:



5.3.3.4 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      ptShvNeuron( new
    Container<Neuron>() );
                            ContainerConPtr ptShvCon( 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] ) );
                                    ptShvNeuron->push_back(ptN);
                            }
                            for (int i=0; i<=2 ; i++) {                              /
    / and a vector with three connections
                                    ptC.reset( new Con( ptShvNeuron->load().a
    t(i), weights[i]) );
                                    vcA.push_back(ptC);
                            }
              // Test
                        ptShvCon->store(vcA);
                        vcB = ptShvCon->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 217 of file Container.cpp.

```
                                                                        {
        return collection;
};
```

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

Definition at line 255 of file Container.cpp.

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

5.3.3.6 template<typename T> void Container< T >::push_back (boost::shared_ptr< T > *TsharedPtr*)

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

                      vc = MyVecCon.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 44 of file Container.cpp.

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

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

Definition at line 250 of file Container.cpp.

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

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

Definition at line 245 of file Container.cpp.

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

5.3.3.9 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      ptShvNeuron( new
    Container<Neuron>() );
                    ContainerConPtr ptShvCon( 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] ) );
                            ptShvNeuron->push_back(ptN);
                    }

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

            // Test
                    ptShvCon->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 93 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();
        }
        return true;
};
```

Here is the caller graph for this function:

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

Returns the size or length of the vector.

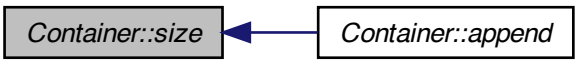
This method returns the size of the vector. In the classes derived from Container<T> this is aliased as numOfCons, numOfNeurons and numOfLayers. The unit test files, e.g., runit.Cpp.Container.R, for usage examples.

Definition at line 240 of file Container.cpp.

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

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

Here is the caller graph for this function:



5.3.3.11 template<typename T> void Container< T >::store (typename std::vector< boost::shared_ptr< T > > v)

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 229 of file Container.cpp.

```
      {
        collection=v;
};
```

5.3.3.12 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 VecCon.

Definition at line 112 of file Container.cpp.

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

```
                itr->validate();
        }
        return true;
};
```

5.3.4 Member Data Documentation

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

Definition at line 14 of file Container.h.

Referenced by Container< Neuron >::begin(), and Container< Neuron >::end().

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

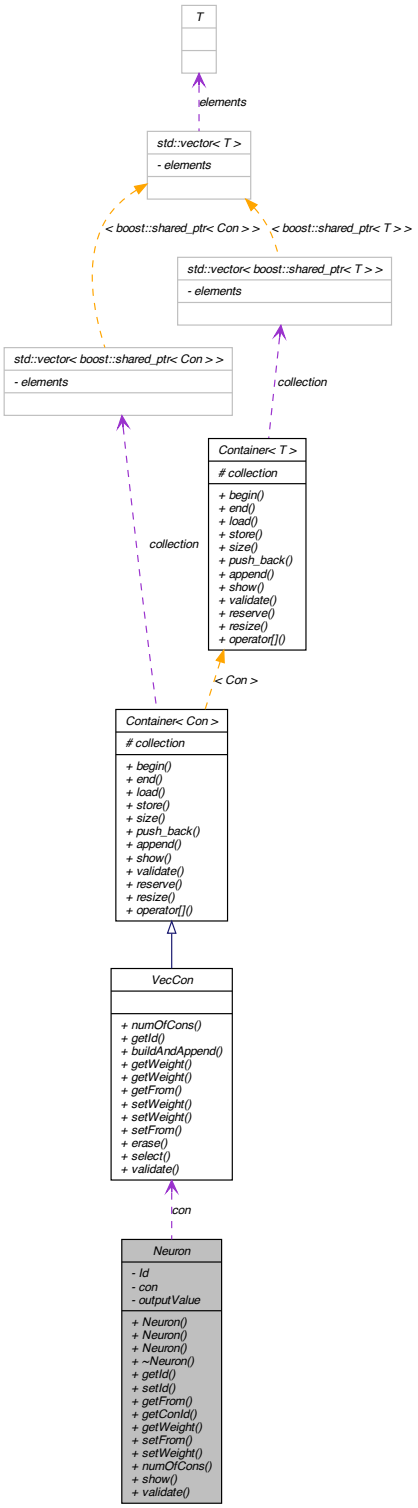
- pkg/AMORE/src/Container.h
- pkg/AMORE/src/Container.cpp

5.4 Neuron Class Reference

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

`#include <Neuron.h>`

Collaboration diagram for Neuron:



Public Member Functions

- Neuron ()
- Neuron (int Id)
- Neuron (int Id, VecCon Con)
- ~Neuron ()
- int getId ()
- void setId (int Id)
- std::vector< NeuronPtr > getFrom ()
- std::vector< int > getConId ()
- std::vector< double > getWeight ()
- bool setFrom (std::vector< NeuronPtr > vFrom)
- bool setWeight (std::vector< double > vWeight)
- int numOfCons ()
- bool show ()
- bool validate ()

Private Attributes

- int Id

  An integer variable with the Neuron Id.
- VecCon con

  A vector of input connections.
- double outputValue

5.4.1 Detailed Description

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 16 of file Neuron.h.

5.4.2 Constructor & Destructor Documentation

5.4.2.1 Neuron::Neuron ( )

Definition at line 12 of file Neuron.cpp.

```
: Id(NA_INTEGER), con() {};
```

5.4.2.2 Neuron::Neuron (int *Id*)

Definition at line 13 of file Neuron.cpp.

```
: Id(Id), outputValue(0.0) {};
```

5.4.2.3 Neuron::Neuron (int *Id*, VecCon *Con*)

Definition at line 14 of file Neuron.cpp.

```
: Id(Id), con(con), outputValue(0.0) {} ;
```

5.4.2.4 Neuron::~Neuron ( )

Definition at line 15 of file Neuron.cpp.

```
{};
```

5.4.3 Member Function Documentation

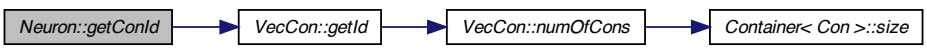
5.4.3.1 std::vector< int > Neuron::getConId ( )

Definition at line 32 of file Neuron.cpp.

References con, and VecCon::getId().

```
                                    {
        return con.getId();
}
```

Here is the call graph for this function:



5.4.3.2 std::vector< NeuronPtr > Neuron::getFrom ( )

Definition at line 27 of file Neuron.cpp.

References con, and VecCon::getFrom().

```
                                                    {
        return con.getFrom();
}
```

Here is the call graph for this function:

5.4.3.3 int Neuron::getId ( )

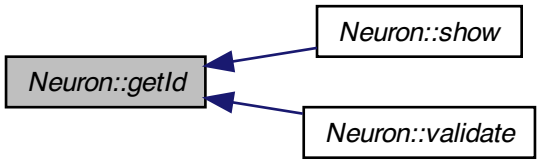
Definition at line 18 of file Neuron.cpp.

References Id.

Referenced by show(), and validate().

```
                {
        return Id;
}
```

Here is the caller graph for this function:



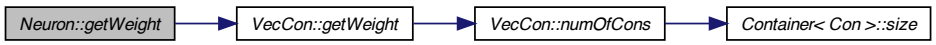
5.4.3.4 std::vector< double > Neuron::getWeight ( )

Definition at line 37 of file Neuron.cpp.

References con, and VecCon::getWeight().

```
                                                {
        return con.getWeight();
}
```

Here is the call graph for this function:



5.4.3.5 int Neuron::numOfCons ( )

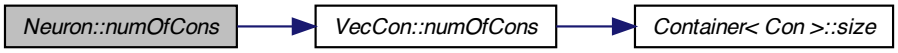
Definition at line 51 of file Neuron.cpp.

References con, and VecCon::numOfCons().

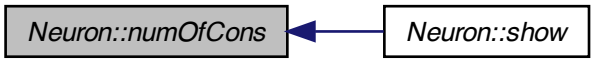
Referenced by show().

```
                          {
        return con.numOfCons();
}
```

Here is the call graph for this function:



Here is the caller graph for this function:



5.4.3.6 bool Neuron::setFrom (std::vector< NeuronPtr > *vFrom*)

Definition at line 42 of file Neuron.cpp.

References con, and VecCon::setFrom().

```
                                                                {
        con.setFrom(vFrom);
}
```

Here is the call graph for this function:

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

Definition at line 22 of file Neuron.cpp.

References Id.

```
                            {
        Id=id;
}
```

5.4.3.8 bool Neuron::setWeight (std::vector< double > *vWeight*)

Definition at line 47 of file Neuron.cpp.

References con, and VecCon::setWeight().

```
                                                                {
        con.setWeight(vWeight);
}
```

Here is the call graph for this function:

5.4.3.9 bool Neuron::show ( )

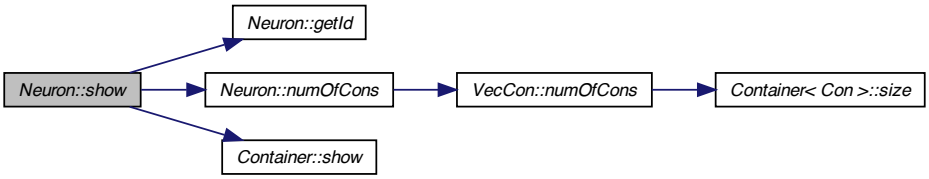
Definition at line 55 of file Neuron.cpp.

References con, getId(), numOfCons(), and Container< T >::show().

```
                                {
        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 (numOfCons()==0) {
                Rprintf("\n No connections defined");
        } else {
                con.show();
        }
        Rprintf("\n------------------------\n");
        return true;

}
```

Here is the call graph for this function:



5.4.3.10 bool Neuron::validate ( )

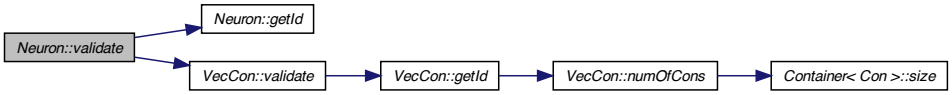
Definition at line 75 of file Neuron.cpp.

References con, getId(), and VecCon::validate().

```
                        {
  BEGIN_RCPP
  if (getId() == NA_INTEGER )             throw std::range_error("[C++ Neur
on::validate]: Error, Id is NA.");
  con.validate();
  return(TRUE);
  END_RCPP

}
```

Here is the call graph for this function:



5.4.4 Member Data Documentation

5.4.4.1 VecCon Neuron::con [private]

A vector of input connections.

Definition at line 28 of file Neuron.h.

Referenced by getConId(), getFrom(), getWeight(), numOfCons(), setFrom(), setWeight(), show(), and validate().

5.4.4.2 int Neuron::Id [private]

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 21 of file Neuron.h.

Referenced by getId(), and setId().

5.4.4.3 double Neuron::outputValue [private]

Definition at line 29 of file Neuron.h.

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

- pkg/AMORE/src/Neuron.h

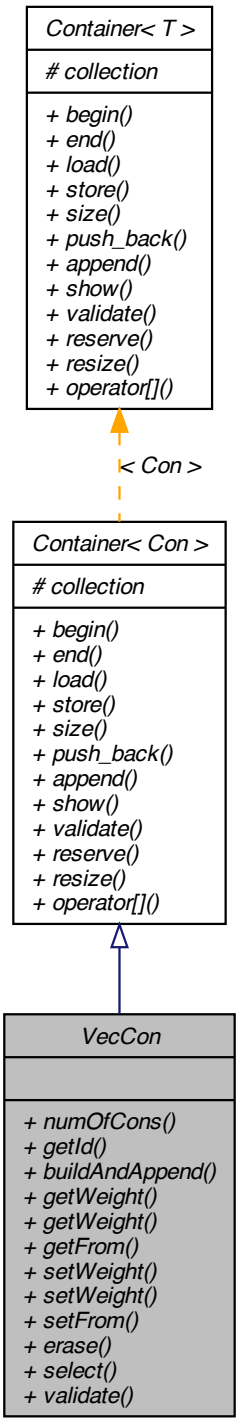
- pkg/AMORE/src/Neuron.cpp

5.5 VecCon Class Reference

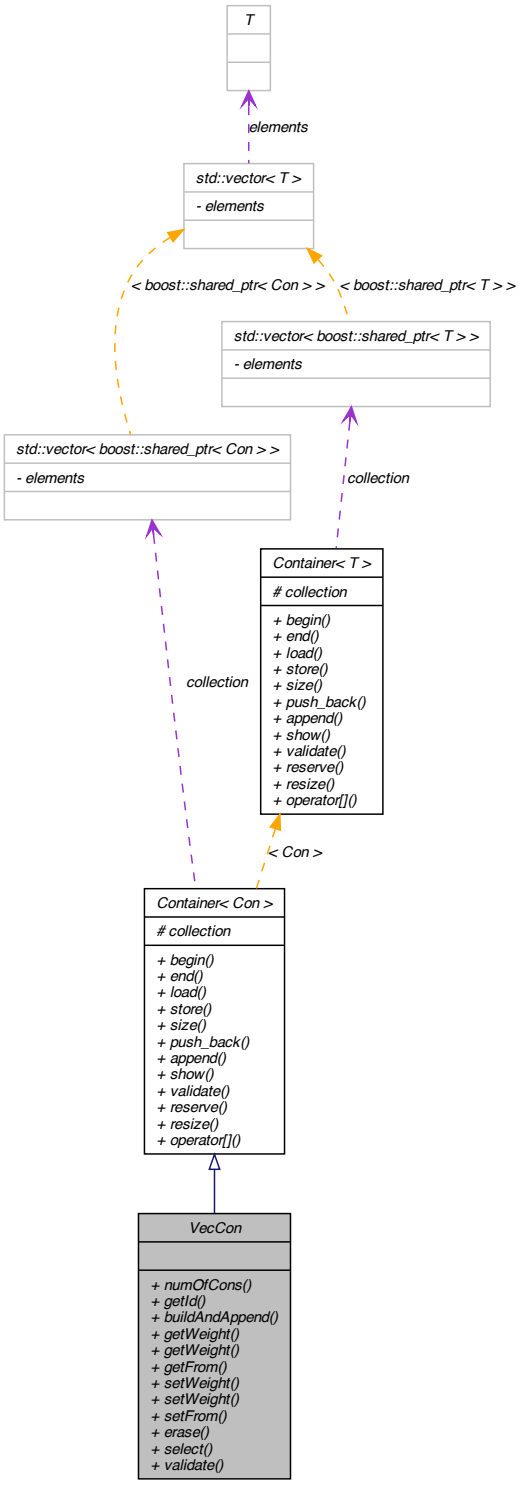
A vector of connections.

`#include <VecCon.h>`

Inheritance diagram for VecCon:



Collaboration diagram for VecCon:



Public Member Functions

- int numOfCons ()

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

  Getter of the Id values of the vector of Cons.
- bool buildAndAppend (std::vector< NeuronPtr > vFrom, std::vector< double > vWeight)

  Builds Con objects and appends them to collection.
- std::vector< double > getWeight ()

  Getter of the weight field of the Con objects related to VecCon.
- std::vector< double > getWeight (std::vector< int > vFrom)

  Getter of the weights of the specified elements from the vecCom object.
- std::vector< NeuronPtr > getFrom ()

  Getter of the from field of the Con objects related to VecCon.
- bool setWeight (std::vector< double > vWeight)

  Setter of the weight field of the Con objects related to VecCon.
- bool setWeight (std::vector< double > vWeight, std::vector< int > vFrom)

  Setter of the weights of the specified elements from the VecCon object.
- bool setFrom (std::vector< NeuronPtr > vFrom)

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

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

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

  Object validator.

5.5.1 Detailed Description

A vector of connections.

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

Definition at line 17 of file VecCon.h.

5.5.2 Member Function Documentation

5.5.2.1 bool VecCon::buildAndAppend (std::vector< NeuronPtr > *vFrom*, std::vector< double > *vWeight*)

Builds Con objects and appends them to collection.

This function provides a convenient way of populating a VecCon object by building and apending Con objects to collection.

Parameters

FROM	A vector of smart pointers to the neurons to be used in the Con::from fields
WEIGHT	A vector of values to be set in the Con::weight fields

```
        //================
        //Usage example:
        //================
        // Data set up
                std::vector<int> result;
                VecCon MyVecCon;
                std::vector<NeuronPtr> vNeuron;
                std::vector<double> vWeight;


        // Test
                NeuronPtr ptNeuron( new Neuron(11) );
                vNeuron.push_back(ptNeuron);
                ptNeuron.reset( new Neuron(22) );
                vNeuron.push_back(ptNeuron);
                ptNeuron.reset( new Neuron(33) );
                vNeuron.push_back(ptNeuron);

                vWeight.push_back(12.3);
                vWeight.push_back(1.2);
                vWeight.push_back(2.1);

                MyVecCon.buildAndAppend(vNeuron, vWeight);

                result=MyVecCon.getId();

        // Now result is a vector that contains the values 11, 22 and 32.
```

See also

append and the unit test files, e.g. runit.Cpp.VecCon.R, for further examples.

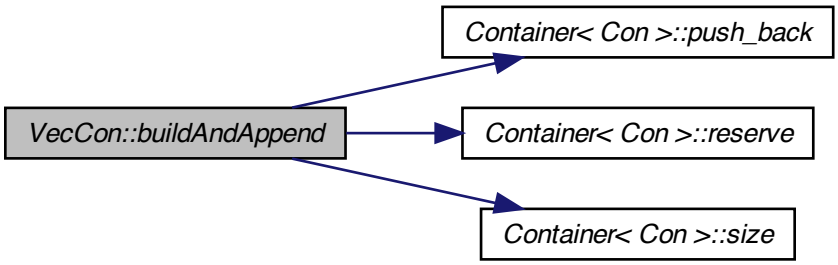
Definition at line 134 of file VecCon.cpp.

References Container< Con >::push_back(), Container< Con >::reserve(), and Container< Con >::size().

```
             {
        BEGIN_RCPP
        if (vFrom.empty()) { throw std::range_error("[VecCon::append]: Error, vFr
      om is empty"); }
        if (vFrom.size() != vWeight.size() ) { throw std::range_error("[VecCon::b
      uildAndAppend]: Error, vFrom.size() != vWeight.size()"); }
        reserve(size() + vFrom.size());
        ConPtr ptCon;
        std::vector<double>::iterator itrWeight = vWeight.begin();

        foreach (NeuronPtr itrFrom, vFrom){
                ptCon.reset(  new Con( itrFrom, *itrWeight) );
                push_back(ptCon);
                itrWeight++;
        }
        return true;
        END_RCPP
}
```

Here is the call graph for this function:



5.5.2.2 void VecCon::erase (std::vector< int > *vFrom*)

Erase the specified elements from the vecCom object.

Provides a convenient way of removing some Con objects from the collection field of the VecCon 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> vNeuron;
                VecConPtr       ptShvCon( new VecCon() );
                VecConPtr vErased;
                ConPtr  ptC;
                NeuronPtr ptN;
                int ids[]= {11, 10, 9, 3, 4, 5, 6, 7, 8, 2, 1};
                std::vector<double> vWeight;
                vWeight.push_back(11.32);
                vWeight.push_back(1.26);
                vWeight.push_back(2.14);
                vWeight.push_back(3.16);
                vWeight.push_back(4.14);
                vWeight.push_back(5.19);
                vWeight.push_back(6.18);
                vWeight.push_back(7.16);
                vWeight.push_back(8.14);
                vWeight.push_back(9.12);
                vWeight.push_back(10.31);
```

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

                    // Test

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

                    ptShvCon->erase(toRemove);
                    ptShvCon->show();
                    result=ptShvCon->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

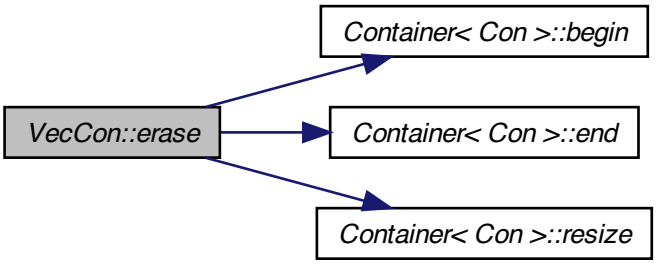
select and the unit test files, e.g. runit.Cpp.VecCon.R, for further examples.

Definition at line 455 of file VecCon.cpp.

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

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

Here is the call graph for this function:



5.5.2.3 std::vector< NeuronPtr > VecCon::getFrom ( )

Getter of the from field of the Con objects related to VecCon.

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 VecCon object.

Returns

An std::vector<NeuronPtr> with the pointer to the incoming neurons.

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

                for (int i=0; i<=2; i++) {
                        ptNeuron.reset( new Neuron(ids[i]) );
                        vNeuron.push_back(ptNeuron);
                        vWeight.push_back(weights[i]);
                }
                MyVecCon.buildAndAppend(vNeuron, vWeight);
        // Test
                vNeuron=MyVecCon.getFrom();
                for (int i=0; i<=2; i++) {
                        result.push_back(vNeuron.at(i)->getId());
                }

// Now result is a vector that contains the values 1, 2 and 3 .
```

See also

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

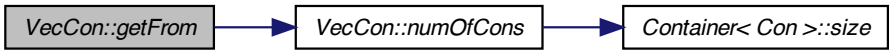
Definition at line 298 of file VecCon.cpp.

References numOfCons().

Referenced by Neuron::getFrom().

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

Here is the call graph for this function:



Here is the caller graph for this function:

5.5.2.4 std::vector< int > VecCon::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;
                        VecCon MyVecCon;
                        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
                        MyVecCon.push_back(ptCon);                              /
      / push_back
                        ptCon.reset(  new Con(&N2, 2.22) );             // create
       new Con and assign to ptCon
                        MyVecCon.push_back(ptCon);                              /
      / push_back
                        ptCon.reset(  new Con(&N3, 3.33) );             // create
       new Con and assign to ptCon
                        MyVecCon.push_back(ptCon);                              /
      / push_back

        // Test
                        MyVecCon.show() ;
                        MyVecCon.validate();
                        result=MyVecCon.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.VecCon.R, for further examples.

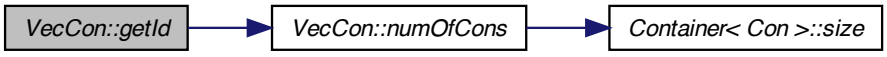
Definition at line 85 of file VecCon.cpp.

References numOfCons().

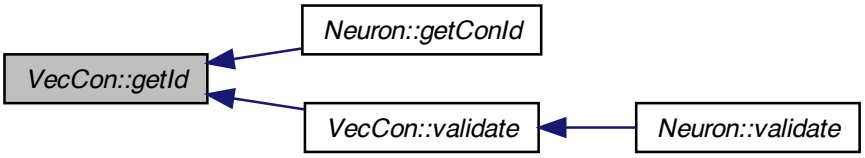
Referenced by Neuron::getConId(), and validate().

```
                              {
        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:



5.5.2.5 std::vector< double > VecCon::getWeight ( )

Getter of the weight field of the Con objects related to VecCon.

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 VecCon object.

Returns

A numeric (double) vector with the weights

```
//================
//Usage example:
//================
// Data set up
        std::vector<double> result;
        VecCon MyVecCon;
        std::vector<NeuronPtr> vNeuron;
        std::vector<double> vWeight;


// Test
        NeuronPtr ptNeuron( new Neuron(11) );
        vNeuron.push_back(ptNeuron);
        ptNeuron.reset( new Neuron(22) );
```

```
                vNeuron.push_back(ptNeuron);
                ptNeuron.reset( new Neuron(33) );
                vNeuron.push_back(ptNeuron);

                vWeight.push_back(12.3);
                vWeight.push_back(1.2);
                vWeight.push_back(2.1);

                MyVecCon.buildAndAppend(vNeuron, vWeight);

                result=MyVecCon.getWeight();

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

See also

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

Definition at line 191 of file VecCon.cpp.

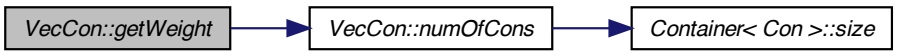
References numOfCons().

Referenced by Neuron::getWeight().

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

        return result;
}
```

Here is the call graph for this function:



Here is the caller graph for this function:

5.5.2.6 std::vector< double > VecCon::getWeight (std::vector< int > *vFrom*)

Getter of the weights of the specified elements from the vecCom object.

Provides a convenient way of getting the weights of some Con objects from the collection field of the VecCon object.

Parameters

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

Returns

An std::vector<double> with the weights of the selected connections

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

  // Data set up

          std::vector<double> result;
          std::vector<NeuronPtr> vNeuron;
          VecConPtr       ptShvCon( new VecCon() );
          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> vWeight;
          for (int i=0; i<11; i++) {
                  vWeight.push_back(weights[i]);
          }
          for (int i=0; i<vWeight.size() ; i++) {                         /
/ Let's create a vector with three neurons
                  ptN.reset( new Neuron( ids[i] ) );
                  vNeuron.push_back(ptN);
          }
          ptShvCon->buildAndAppend(vNeuron, vWeight);

  // Test
          std::vector<int> toSelect;
          toSelect.push_back(1);
          toSelect.push_back(3);
          toSelect.push_back(5);
          toSelect.push_back(7);

          result=ptShvCon->getWeight(toSelect);

  // Now, result is a numeric vector with the values  10.31, 3.16,  5.19 an
d 7.16.
```

See also

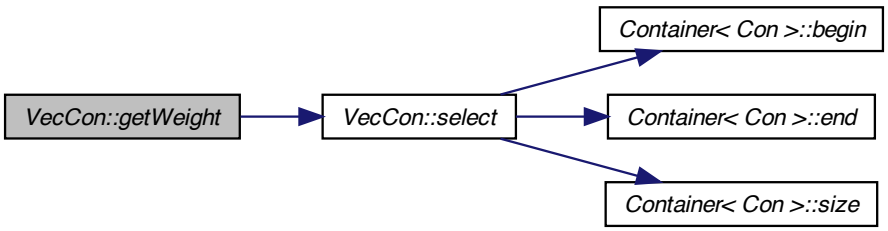
setWeigth and the unit test files, e.g. runit.Cpp.VecCon.R, for further examples.

Definition at line 568 of file VecCon.cpp.

References select().

```
                                                                                {
        return  select(vFrom)->getWeight();
}
```

Here is the call graph for this function:



5.5.2.7 int VecCon::numOfCons ( )

Size of the VecCon object.

This function returns the size of the VecCon 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      ptShvNeuron( new
    Container<Neuron>() );
                              VecConPtr       ptShvCon( new VecCon() );
                              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] ) );
                                      ptShvNeuron->push_back(ptN);
                              }
      // Test
                              for (int i=0; i<=2 ; i++) {                       /
    / and a vector with three connections
                                      result.push_back(ptShvCon->numOfCons());
```

```
/ Append numOfCons to result, create new Con and push_back into MyVecCon
                                    ptC.reset( new Con( ptShvNeuron->load().a
t(i), weights[i]) );
                                    ptShvCon->push_back(ptC);
                                }

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

See also

Container::size (alias)

Definition at line 42 of file VecCon.cpp.

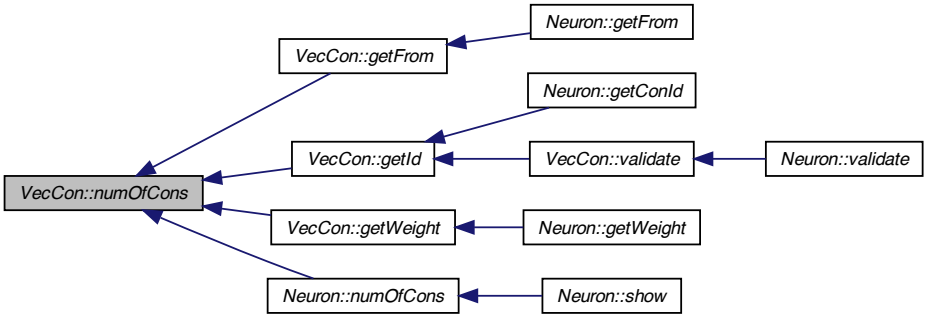
References Container< Con >::size().

Referenced by getFrom(), getId(), getWeight(), and Neuron::numOfCons().

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

Here is the call graph for this function:

Here is the caller graph for this function:



5.5.2.8 VecConPtr VecCon::select (std::vector< int > *vFrom*)

Selects the specified elements from the vecCom object.

Provides a convenient way of selecting some Con objects from the collection field of the VecCon 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> vNeuron;
          VecConPtr       ptShvCon( new VecCon() );
          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> vWeight;
          for (int i=0; i<11; i++) {
                  vWeight.push_back(weights[i]);
          }
          for (int i=0; i<vWeight.size() ; i++) {                         /
/ Let's create a vector with three neurons
                  ptN.reset( new Neuron( ids[i] ) );
                  vNeuron.push_back(ptN);
          }
          ptShvCon->buildAndAppend(vNeuron, vWeight);
          // Test
          std::vector<int> toSelect;
          toSelect.push_back(1);
          toSelect.push_back(3);
          toSelect.push_back(5);
          toSelect.push_back(7);

          VecConPtr  vSelect (  ptShvCon->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.VecCon.R, for further examples.

Definition at line 507 of file VecCon.cpp.

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

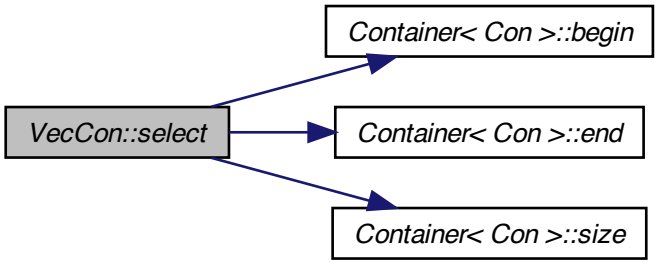
Referenced by getWeight(), and setWeight().

```
                                                {
```

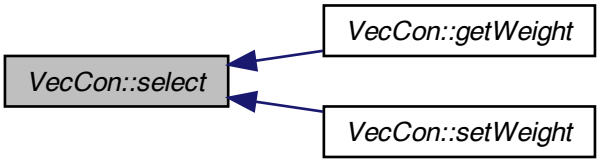
```
        VecConPtr result(new VecCon );
        result->reserve(size());
        sort (begin(), end(), CompareId());
        sort (vFrom.begin(), vFrom.end());
        set_intersection(begin(), end(), vFrom.begin(), vFrom.end(), back_inserte
      r(result->collection) , CompareId());

        return result;
}
```

Here is the call graph for this function:



Here is the caller graph for this function:



5.5.2.9 bool VecCon::setFrom (std::vector< NeuronPtr > *vFrom*)

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

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 VecCon object.

Parameters

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

Returns

true if not exception is thrown

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

  // Data set up
          std::vector<int> result;
          ContainerNeuronPtr      ptShvNeuron( new Container<Neuron>() );
          VecConPtr       ptShvCon( new VecCon() );
          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] ) );
                  ptShvNeuron->push_back(ptN);
          }
          for (int i=0; i<=2 ; i++) {                             // and a
vector with three connections
                  ptC.reset( new Con() );
                  ptShvCon->push_back(ptC);
          }
  // Test
          ptShvCon->setFrom(ptShvNeuron->load()) ;
          ptShvCon->show();
          result=ptShvCon->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.VecCon.R, for further examples.

Definition at line 353 of file VecCon.cpp.

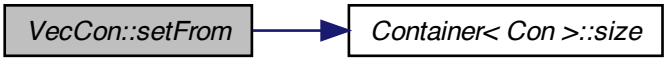
References Container< Con >::size().

Referenced by Neuron::setFrom().

```
                                                  {
  BEGIN_RCPP
          if (vFrom.empty()) { throw std::range_error("[ C++ VecCon::setFro
m]: Error, w is empty"); }
          if (vFrom.size() != size() ) { throw std::range_error("[C++ VecCo
n::setFrom]: Error, w.size() != collection.size()"); }
          std::vector<NeuronPtr>::iterator itrFrom = vFrom.begin();
          foreach(ConPtr itr , *this)     {
                  itr->setFrom( *itrFrom );
                  itrFrom++;
          }
```

```
                return true;
                END_RCPP
}
```

Here is the call graph for this function:



Here is the caller graph for this function:

5.5.2.10 bool VecCon::setWeight (std::vector< double > *vWeight*, std::vector< int > *vFrom*)

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

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

Parameters

vWeight	A numeric (double) vector with the weights to be set in the Con objects contained in the VecCon 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> vNeuron;
                  VecConPtr       ptShvCon( new VecCon() );
                  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> vWeight;
                  for (int i=0; i<11; i++) {
                  vWeight.push_back(weights[i]);
                  }
                  for (int i=0; i<vWeight.size() ; i++) {                    /
/ Let's create a vector with three neurons
                  ptN.reset( new Neuron( ids[i] ) );
                  vNeuron.push_back(ptN);
                  }
                  ptShvCon->buildAndAppend(vNeuron, vWeight);

                  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);
                  ptShvCon->setWeight(vNewWeights, toSelect);

  // Test
                  result = ptShvCon->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

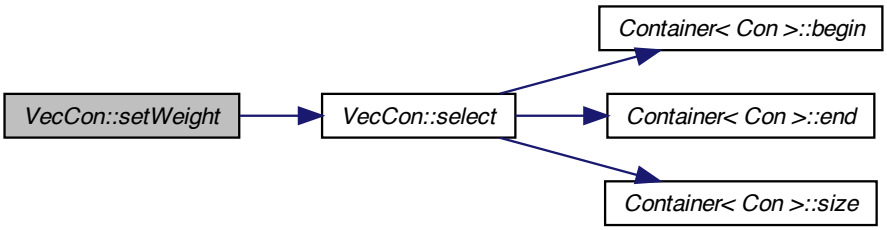
getWeigth and the unit test files, e.g. runit.Cpp.VecCon.R, for further examples.

Definition at line 630 of file VecCon.cpp.

References select().

```
{
 BEGIN_RCPP
 return  select(vFrom)->setWeight(vWeight);
 END_RCPP
}
```

Here is the call graph for this function:



5.5.2.11 bool VecCon::setWeight (std::vector< double > *vWeight*)

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

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 VecCon object.

Parameters

vWeight	A numeric (double) vector with the weights to be set in the Con objects contained in the VecCon 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 };
                VecCon MyVecCon;
                std::vector<NeuronPtr> vNeuron;
                std::vector<double> vWeight;
                NeuronPtr ptNeuron;

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

```
                        for (int i=0; i<=2; i++) {
                                vWeight.at(i)=weights[i];
                        }
  // Test
                        MyVecCon.setWeight(vWeight);                    // weight
s are set to 12.3, 1.2 and 2.1
                        result=MyVecCon.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.VecCon.R, for further examples.

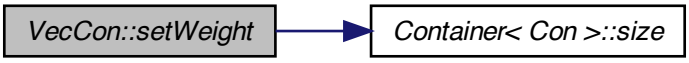
Definition at line 244 of file VecCon.cpp.

References Container< Con >::size().

Referenced by Neuron::setWeight().

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

Here is the call graph for this function:



Here is the caller graph for this function:

5.5.2.12 bool VecCon::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 VecCon 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.VecCon.R, for usage examples.

Reimplemented from Container< Con >.

Definition at line 655 of file VecCon.cpp.

References getId().

Referenced by Neuron::validate().

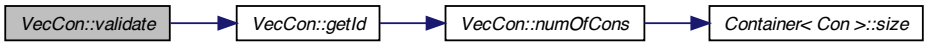
```
                {
  BEGIN_RCPP

  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++ VecCon::validate]:
Error, duplicated Id.");
  Container<Con>::validate();
  return(true);
  END_RCPP
```

```
};
```

Here is the call graph for this function:



Here is the caller graph for this function:

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

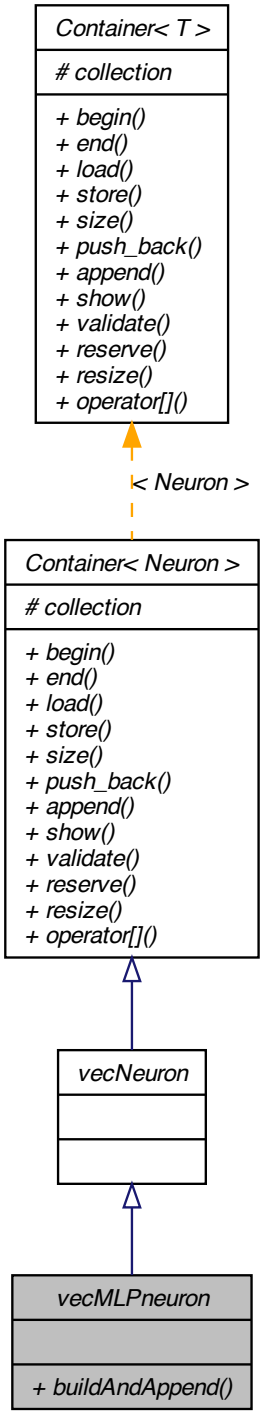
- pkg/AMORE/src/VecCon.h
- pkg/AMORE/src/VecCon.cpp

5.6 vecMLPneuron Class Reference

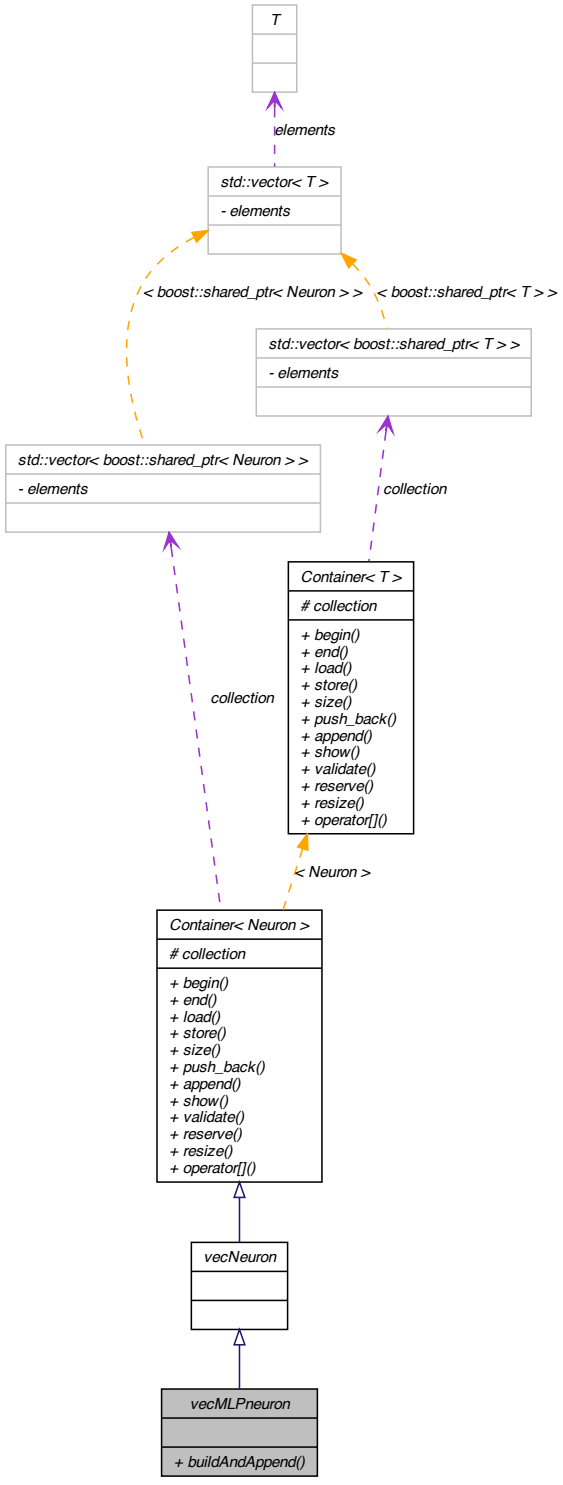
A vector of connections.

`#include <VecMLPneuron.h>`

Inheritance diagram for vecMLPneuron:



Collaboration diagram for vecMLPneuron:



Public Member Functions

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

5.6.1 Detailed Description

A vector of connections.

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

Definition at line 17 of file VecMLPneuron.h.

5.6.2 Member Function Documentation

5.6.2.1 bool vecMLPneuron::buildAndAppend (std::vector< int > *IDS*, std::vector< int > *BIAS*, VecCon *VC*)

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

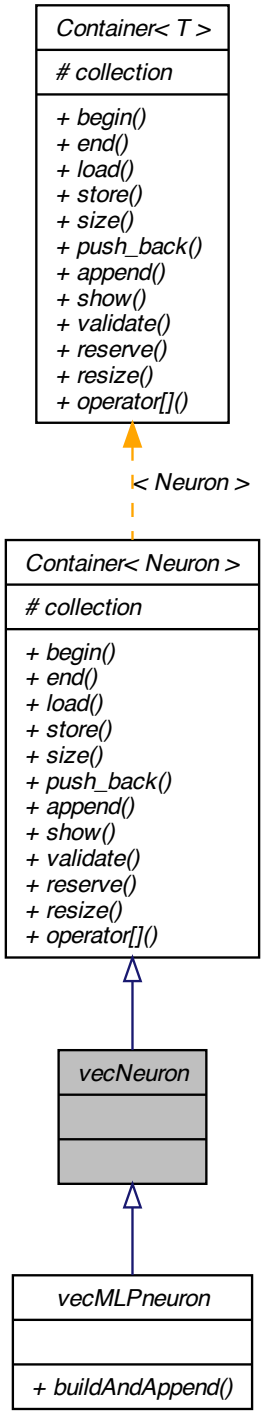
- pkg/AMORE/src/VecMLPneuron.h

5.7 vecNeuron Class Reference

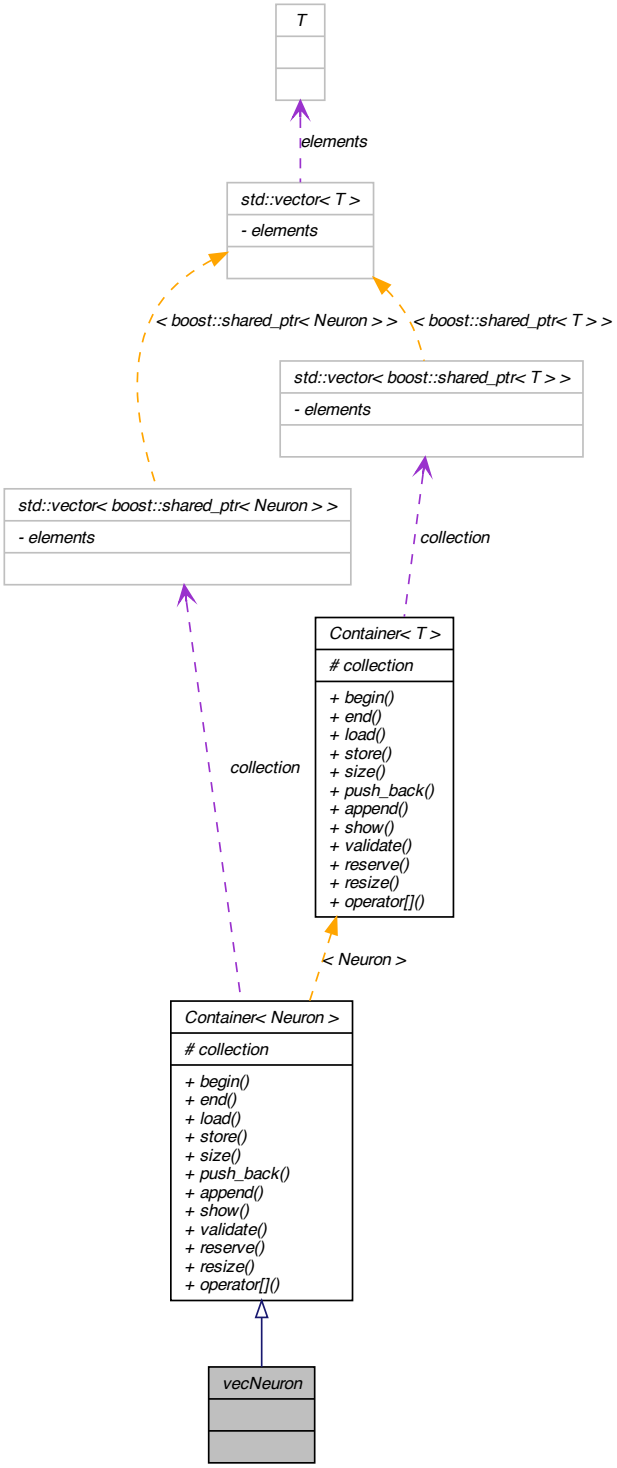
A vector of neurons.

`#include <VecNeuron.h>`

Inheritance diagram for vecNeuron:



Collaboration diagram for vecNeuron:



5.7.1 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 18 of file VecNeuron.h.

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

- pkg/AMORE/src/VecNeuron.h

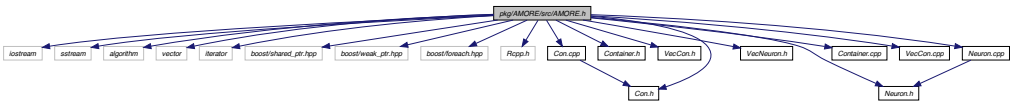
Chapter 6

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 "VecCon.h"
#include "Neuron.h"
#include "VecNeuron.h"
#include "Con.cpp"
#include "Container.cpp"
#include "VecCon.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 boost::shared_ptr< Container< Con > > ContainerConPtr
- typedef boost::shared_ptr< Container< Neuron > > ContainerNeuronPtr
- typedef boost::shared_ptr< VecCon > VecConPtr
- typedef boost::shared_ptr< VecNeuron > VecNeuronPtr

6.1.1 Define Documentation

6.1.1.1 #define foreach BOOST_FOREACH

Definition at line 38 of file AMORE.h.

6.1.1.2 #define size_type unsigned int

Definition at line 41 of file AMORE.h.

6.1.2 Typedef Documentation

6.1.2.1 typedef boost::shared_ptr<Con> ConPtr

Definition at line 44 of file AMORE.h.

6.1.2.2 typedef boost::shared_ptr< Container<Con> > ContainerConPtr

Definition at line 47 of file AMORE.h.

6.1.2.3 typedef boost::shared_ptr< Container<Neuron> > ContainerNeuronPtr

Definition at line 48 of file AMORE.h.

6.1.2.4 typedef boost::shared_ptr<Neuron> NeuronPtr

Definition at line 45 of file AMORE.h.

6.1.2.5 typedef boost::weak_ptr<Neuron> NeuronWeakPtr

Definition at line 46 of file AMORE.h.

6.1.2.6 typedef boost::shared_ptr< VecCon > VecConPtr

Definition at line 49 of file AMORE.h.

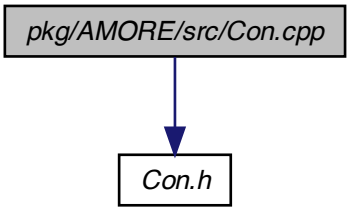
6.1.2.7 typedef boost::shared_ptr< VecNeuron > VecNeuronPtr

Definition at line 50 of file AMORE.h.

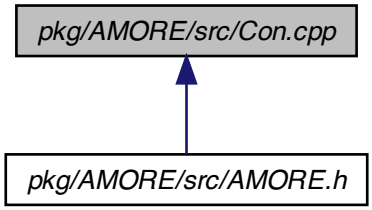
6.2 pkg/AMORE/src/Con.cpp File Reference

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

Include dependency graph for Con.cpp:

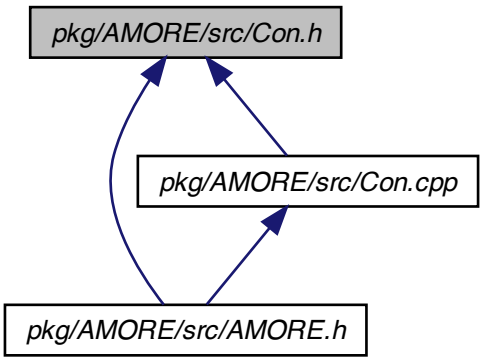


This graph shows which files directly or indirectly include this file:



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

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



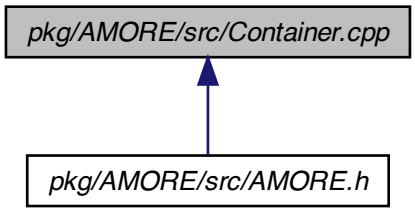
Classes

- class Con

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

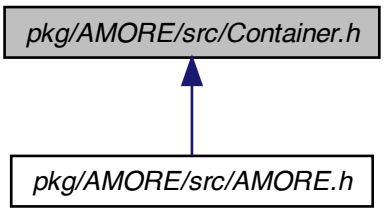
6.4 pkg/AMORE/src/Container.cpp File Reference

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



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

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



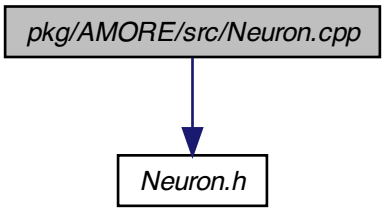
Classes

- class Container< T >

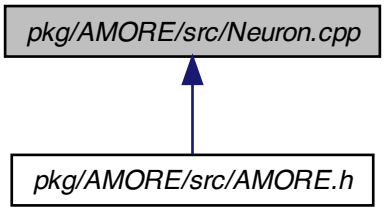
6.6 pkg/AMORE/src/Neuron.cpp File Reference

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

Include dependency graph for Neuron.cpp:

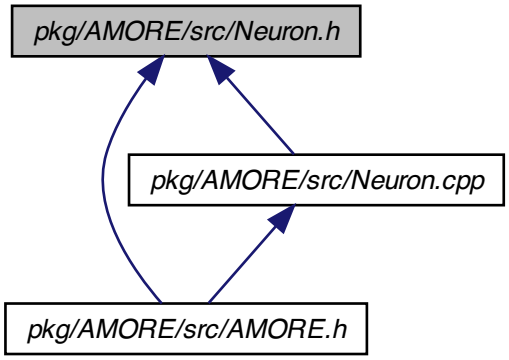


This graph shows which files directly or indirectly include this file:



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

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



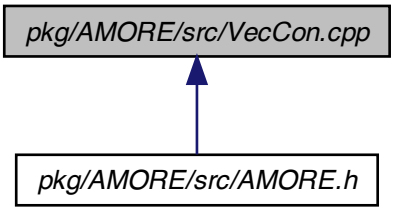
Classes

- class Neuron

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

6.8 pkg/AMORE/src/VecCon.cpp File Reference

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

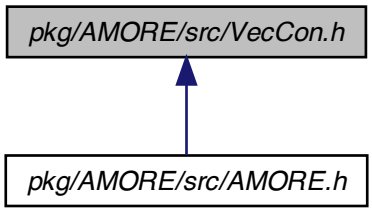


Classes

- struct CompareId

6.9 pkg/AMORE/src/VecCon.h File Reference

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



Classes

- class VecCon

  A vector of connections.

6.10 pkg/AMORE/src/VecMLPneuron.h File Reference

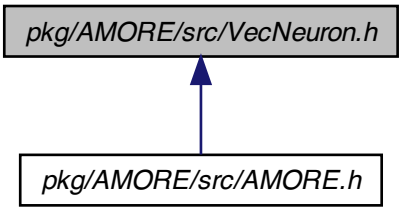
Classes

- class vecMLPneuron

  A vector of connections.

6.11 pkg/AMORE/src/VecNeuron.h File Reference

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



Classes

- class vecNeuron

  A vector of neurons.

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