Reference Manual

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Contents

Chapter 1

Beowulf Analysis Symbolic INterface

Parallel computing has become an increasingly important tool for scientists working with large data sets. A “Beowulf” cluster utilizes commodity personal computers and off-the-shelf switches to achieve very cost-effective performance compared to other supercomputing architectures. A generic problem in computational physics is that vastly different physical problems frequently require very similar numerical treatments; however, individual research groups have no easy way to effectively share analysis tools, and thus must constantly re-invent (or at least re-code) the wheel. Certain operations (such as performing coordinate transformations, binning data, and calculating statistical moments of a distribution ec “Bf A Nycalh z “r) fi ri ff u

6.2 ba< T > Class Template Reference

- T **operator[ ]** (const int index)
- **ba**< T > **operator^** (T y)
- **ba**< T > **operator=** (const **ba**< T > b)
- template<typename U>

```
//now can properly size data array
double* theData = new double[hi-lo+1];
if( atv.attribute(myKey, theData) == 0)WDxi data array ssoR W erl a arrs W}ri )) heelsRte_l th R L (9
```

- int **set_boundarytype** (int BoundaryTypeNew)

  Set the type of boundary, eg Periodic, Isolated, etc.

- int **set_spacetype** (int SpaceTypeNew)

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

- **Geometry.h**

6. gnuplot Class Reference

Gnuplot API

`#include <gnuplot`

- void **set_title** (const string)

  sets the title of the plot

- void **set_xlabel** (const string)

  sets the label of the X axis

- void **set_xrange** (const string)

  sets the extend of the X axis

- void **set_ylabel** (const string)

  sets the label of the Y axis

- void **set_yrange** (const string)

  sets the extend of the Y a

```
p << flush;
```

Note:

The optional argument is intended primarily

[illegible]

will produce this output:

```
1 2
...
<newline>
2 3
...
<newline>
3 4
...
<newline>
```

It's action can be reversed with **reset**

6. .3.9 void gnuplot::set_multiplot (const unsigned *char* = 1, const unsigned *char* = 1)

creates tiled plots or plots of multiple data sets

6. gnuplot Class

[illegible] Grid Class Reference

This set attribute takes lo and hi positions to write to a range.

- template<class T> int **set_attribute** (string key, int iLo, int iHi, vector< T > n **II** **Hm 3 nt e t2**

[illegible].7 List Class Reference

List Derived class List is a specific **Data**(p. 2[illegible]) which is one-dimensional and has a "primary sort".

Can pass it a vector too (entire range).

- template<class T> int **set_attribute** (string key, int iLo, int iHi, T newData)

  set_attribute taking hi and low indices of range

- template

- int **calculate_nth_nearest** (int particleDepth, const vector< float > testPos)
  Calculate the nth nearest particle with respect to a given particle.

List Statistics Functions

Computing basic statistical values and histograms.

- int **comp**

You must send the particle depth and the index of the given particle

6. .3.2 int List::com

[illegible].

Display the contents of the myHistory list.

Basic Calculation Functions

Functions

6.8.3.6 ListL

You must specify the **List**(p.

[illegible]

Host operator +.

- **Vector2 operator+=** (const **Vector2** b)

= (const double b)

Vector2 **q**

Vector2 +=.

- **Vector2 operator-=** (const **Vector2** b)

6.10 Vector3 Class Reference

A class for 3-dimensional vectors.

`#include "Vector3.h"`

Public Member Functions

- template

Host operator +.

- **Vector3 operator**+= (const **Vector3** b)

  Vector3 +

Chapter 7

File Documentation

7.1 BA.h File Reference

Contains BA (BasinArray), an N-dimensional distributed array class, based upon MPI-2.

```
#include "mpi.h"
#include "gen_struct.h"
#include "ba_trait.h"
#include "mpio.h"
#include "fparser.hh"
#include <math.h>
#include <iostream>
#include <>
```

7.3 basin.h File Reference

Contains the standard includes for the project as well as some defines.

```
#include "mpi.h"
#include <[illegible]
```

Isolated Boundary.

- #define **PERIODIC** 1

  Periodic Boundary.

Defined Space Ty

7. gen_struct.h ile Ref

.6 G[redacted]om[redacted]

7.8 Vec r2.h ile Reference

ontain **S ector2** (p. 50), a 2D vector cla .

```
#include "basin.h"

#include "ge
```

7.5.2 Function

Chapter 8

Page Documentation

8.1 Bug List

Member gnuplot::set_multiplot(p. 57)**(const unsigned char=1, const unsigned char=1)**
It's important to note that in order to produce good-looking tiled plots of (nearly) arbitrary size, the algorithm for calculating spaces and placements would have to be greatly improved - it's