FinalProject459

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Contents

Chapter 1

Class Index

1.1 Class List

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

Chapter 2

Class Documentation

2.1 collisionDetector Class Reference

collisionDetector class determines whether there is collision between a triangle and a sphere

Public Member Functions

- **collisionDetector** (ArrayList< String[ ]> meshData, ArrayList< String[ ]> sphereData, int numberTriangles, int numberSpheres, double radius)

Protected Member Functions

- ArrayList< String[ ]> getTriangleData (ArrayList< String[ ]> meshData, int index)
- boolean sphereTriangleIntersection (ArrayList< String[ ]> triangleData, String[ ] sphereData)
- double point2SegDist (double[ ] P, double[ ] A, double[ ] B)

2.1.1 Detailed Description

collisionDetector class determines whether there is collision between a triangle and a sphere

Parameters

meshData	is an ArrayList<String[ ]> which stores the mesh data and also a constructor input
sphereData	is an ArrayList<String[ ]> which stores the sphere data and also a constructor input
numberTriangles	is an int which stores the number of triangles and also a constructor input
numberSpheres	is an int which stores the number of spheres and also a constructor input
radius	is a double which stores the radius of spheres and also a constructor input

2.1.2 Member Function Documentation

2.1.2.1 getTriangleData()

```
ArrayList<String[]> collisionDetector.getTriangleData (
            ArrayList< String[]> meshData,
            int index )  [protected]
```

function getTriangleData(ArrayList<String[]> meshData, int index) gets XYZ coordinates of a triangle

Parameters

meshData	is an ArrayList<String[]> that stores the mesh data
index	is an int that specifies the index of the triangle

Returns

ArrayList<String[]> that stores data of index-th triangle

2.1.2.2 point2SegDist()

```
double collisionDetector.point2SegDist (
            double [] P,
            double [] A,
            double [] B )  [protected]
```

function point2SegDist(double[] P, double[] A, double[] B) determines the distance between a point P and a segment line AB in space

Parameters

P	is a double[] that stores the XYZ coordinates of the point P
A	is a double[] that stores the XYZ coordinates of the point A
B	is a double[] that stores the XYZ coordinates of the point B

Returns

double, the distance between a point P and a segment line AB in space

2.1.2.3 sphereTriangleIntersection()

```
boolean collisionDetector.sphereTriangleIntersection (
            ArrayList< String[]> triangleData,
            String [] sphereData )  [protected]
```

function sphereTriangleIntersection(ArrayList<String[]> triangleData, String[] sphereData) determines whether there is collision between a triangle and a sphere

Parameters

triangleData	is an ArrayList<String[ ]> that stores XYZ coordinates of a triangle
sphereData	is a String[] that stores XYZ coordinates of a sphere

Returns

boolean, true for collision, false for no collision

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

- /Users/Grant/Desktop/ME459/FinalProject/src/collisionDetector.java

2.2 helper Class Reference

helper class is used for writing data into output file

Public Member Functions

- **helper** (ArrayList< int[ ]> collisionPair)

Protected Member Functions

- void writeToFile () throws IOException

2.2.1 Detailed Description

helper class is used for writing data into output file

Parameters

collisionPair	is an ArrayList<int[ ]> stores the data for output also a constructor input

2.2.2 Member Function Documentation

2.2.2.1 writeToFile()

```
void helper.writeToFile ( ) throws IOException  [protected]
```

writeToFile() function writes the data into a file called "collision_detection.out"

Returns

nothing

Exceptions

IOException	

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

- /Users/Grant/Desktop/ME459/FinalProject/src/helper.java

2.3 Main Class Reference

Entry point for the program to run.

Static Public Member Functions

- static void main (String[ ] args)

2.3.1 Detailed Description

Entry point for the program to run.

2.3.2 Member Function Documentation

2.3.2.1 main()

```
static void Main.main (
            String [] args )  [static]
```

main function

Parameters

collisionPair	is an ArrayList<int[ ]> that stores the collision pair for sphere i and triangle j

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

- /Users/Grant/Desktop/ME459/FinalProject/src/Main.java

2.4 meshDataReader Class Reference

meshDataReader class reads the mesh data from an input file called "mesh.input"

Protected Member Functions

- void readMeshData ()
- void outputMeshData ()

2.4.1 Detailed Description

meshDataReader class reads the mesh data from an input file called "mesh.input"

Parameters

meshData	is an ArrayList<String[]> stores the data from the file
numberTriangles	is an int stores the number of triangles

2.4.2 Member Function Documentation

2.4.2.1 outputMeshData()

```
void meshDataReader.outputMeshData ( )  [protected]
```

outputMeshData() outputs the mesh data for testing

Returns

nothing

2.4.2.2 readMeshData()

```
void meshDataReader.readMeshData ( )  [protected]
```

readMeshData() reads the mesh data

Returns

nothing

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

- /Users/Grant/Desktop/ME459/FinalProject/src/meshDataReader.java

2.5 sphereDataReader Class Reference

sphereDataReader class reads the sphere data from an input file called "spheres.input"

Protected Member Functions

- void readSphereData ()
- void outputSphereData ()

2.5.1 Detailed Description

sphereDataReader class reads the sphere data from an input file called "spheres.input"

Parameters

sphereData	is an ArrayList<String[]> stores the data from the file
radius	is a double that stores the radius of the spheres
numberSpheres	is an int that stores the number of spheres

2.5.2 Member Function Documentation

2.5.2.1 outputSphereData()

```
void sphereDataReader.outputSphereData ( )  [protected]
```

outputSphereData() outputs the mesh data for testing

Returns

nothing

2.5.2.2 readSphereData()

```
void sphereDataReader.readSphereData ( )  [protected]
```

readSphereData() reads the sphere data

Returns

nothing

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

- /Users/Grant/Desktop/ME459/FinalProject/src/sphereDataReader.java

Index