

MeshLib

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Chapter 1

Meshlib

1.1 Introduction

Meshlib is a simple mesh library written in C.

1.2 Build

To build the whole project, Code::blocks is required.

1.3 Contents

Load/Write PLY, OFF, ASC files.

Basic Vertex Manipulations.

Basic Vertex Transformations.

Basic Face Manipulations.

Bilateral Filtering.

Laplacian Filtering.

Mesh Cleaning Algorithms.

Chapter 2

Data Structure Index

2.1 Data Structures

Here are the data structures with brief descriptions:

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mesh_edge	11
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Chapter 3

File Index

3.1 File List

Here is a list of all files with brief descriptions:

meshcalc.c	This file contains functions pertaining to different mesh computations	17
meshclean.c	This file contains functions pertaining to different mesh cleaning algorithms	26
meshcreate.c	This file contains functions pertaining to mesh creation and freeing	31
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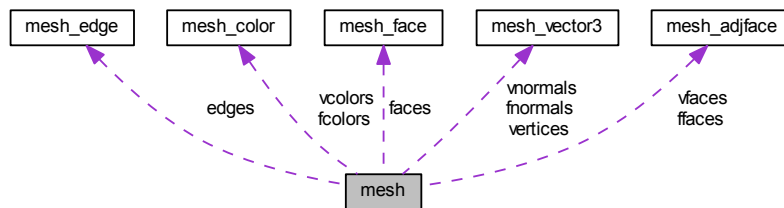
Chapter 4

Data Structure Documentation

4.1 mesh Struct Reference

```
#include <meshlib.h>
```

Collaboration diagram for mesh:



Data Fields

- `uint8_t origin_type`
- `uint8_t is_loaded`
- `uint8_t is_vertices`
- `uint8_t is_faces`
- `uint8_t is_edges`
- `uint8_t is_vnormals`
- `uint8_t is_fnormals`
- `uint8_t is_vcolors`
- `uint8_t is_fcolors`
- `uint8_t is_vfaces`
- `uint8_t is_ffaces`
- `uint8_t is_fareas`
- `INTDATA num_vertices`
- `INTDATA num_faces`
- `INTDATA num_edges`
- `MESH_VERTEX vertices`
- `MESH_FACE faces`
- `MESH_EDGE edges`
- `MESH_NORMAL vnormals`

- [MESH_NORMAL fnormals](#)
- [MESH_COLOR vcolors](#)
- [MESH_COLOR fcolors](#)
- [MESH_VFACE vfaces](#)
- [MESH_FFACE ffaces](#)
- [FLOATDATA * fareas](#)
- [uint8_t is_trimesh](#)
- [uint8_t dummy](#)

4.1.1 Field Documentation

4.1.1.1 `uint8_t dummy`

4.1.1.2 `MESH_EDGE` edges

Pointer to edges

4.1.1.3 `MESH_FACE` faces

Pointer to faces

4.1.1.4 `FLOATDATA* fareas`

Pointer to face areas

4.1.1.5 `MESH_COLOR fcolors`

Pointer to face colors

4.1.1.6 `MESH_FFACE ffaces`

Pointer to face adjacent faces

4.1.1.7 `MESH_NORMAL fnormals`

Pointer to face normals

4.1.1.8 `uint8_t is_edges`

Has edges?

4.1.1.9 `uint8_t is_faces`

Has faces?

4.1.1.10 `uint8_t is_fareas`

Has face areas?

4.1.1.11 `uint8_t is_fcolors`

Has face colors?

4.1.1.12 `uint8_t is_ffaces`

Has face adjacent faces?

4.1.1.13 `uint8_t is_fnormals`

Has face normals?

4.1.1.14 `uint8_t is_loaded`

Is loaded?

4.1.1.15 `uint8_t is_trimesh`

Is trimesh?

4.1.1.16 `uint8_t is_vcolors`

Has vertex colors?

4.1.1.17 `uint8_t is_vertices`

Has vertices?

4.1.1.18 `uint8_t is_vfaces`

Has vertex adjacent faces?

4.1.1.19 `uint8_t is_vnormals`

Has vertex normals?

4.1.1.20 `INTDATA num_edges`

Number of edges

4.1.1.21 `INTDATA num_faces`

Number of faces

4.1.1.22 `INTDATA num_vertices`

Number of vertices

4.1.1.23 `uint8_t` `origin_type`

Origin type

4.1.1.24 `MESH_COLOR` `vcolors`

Pointer to vertex colors

4.1.1.25 `MESH_VERTEX` `vertices`

Pointer to vertices

4.1.1.26 `MESH_VFACE` `vfaces`

Pointer to vertex adjacent faces

4.1.1.27 `MESH_NORMAL` `vnormals`

Pointer to vertex normals

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

- [meshlib.h](#)

4.2 `mesh_adjface` Struct Reference

```
#include <meshlib.h>
```

Data Fields

- [INTDATA](#) `num_faces`
- [INTDATA](#) * `faces`

4.2.1 Field Documentation

4.2.1.1 `INTDATA*` `faces`

Pointer to adjacent face indices

4.2.1.2 `INTDATA` `num_faces`

Number of adjacent faces

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

- [meshlib.h](#)

4.3 `mesh_color` Struct Reference

```
#include <meshlib.h>
```

Data Fields

- [FLOATDATA r](#)
- [FLOATDATA g](#)
- [FLOATDATA b](#)
- [FLOATDATA a](#)

4.3.1 Field Documentation

4.3.1.1 FLOATDATA a

Alpha channel

4.3.1.2 FLOATDATA b

Green channel

4.3.1.3 FLOATDATA g

Blue channel

4.3.1.4 FLOATDATA r

Red channel

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

- [meshlib.h](#)

4.4 mesh_edge Struct Reference

```
#include <meshlib.h>
```

Data Fields

- [INTDATA vertices](#) [2]
- [INTDATA faces](#) [2]

4.4.1 Field Documentation

4.4.1.1 INTDATA faces[2]

Edge faces

4.4.1.2 INTDATA vertices[2]

Edge vertices

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

- [meshlib.h](#)

4.5 mesh_face Struct Reference

```
#include <meshlib.h>
```

Data Fields

- [INTDATA num_vertices](#)
- [INTDATA * vertices](#)

4.5.1 Field Documentation

4.5.1.1 INTDATA num_vertices

Number of vertices

4.5.1.2 INTDATA* vertices

Pointer to vertex indices

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

- [meshlib.h](#)

4.6 mesh_rotation Struct Reference

```
#include <meshlib.h>
```

Data Fields

- [FLOATDATA data](#) [9]

4.6.1 Field Documentation

4.6.1.1 FLOATDATA data[9]

Matrix data

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

- [meshlib.h](#)

4.7 mesh_struct Struct Reference

```
#include <meshlib.h>
```

Data Fields

- [INTDATA num_items](#)
- [INTDATA * items](#)

4.7.1 Field Documentation

4.7.1.1 INTDATA* items

Pointer to INTDATA items

4.7.1.2 INTDATA num_items

Number of items

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

- [meshlib.h](#)

4.8 mesh_struct2 Struct Reference

```
#include <meshlib.h>
```

Data Fields

- [INTDATA num_items](#)
- [INTDATA2 * items](#)

4.8.1 Field Documentation

4.8.1.1 INTDATA2* items

Pointer to INTDATA2 items

4.8.1.2 INTDATA num_items

Number of items

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

- [meshlib.h](#)

4.9 mesh_struct3 Struct Reference

```
#include <meshlib.h>
```

Data Fields

- [INTDATA num_items](#)
- [INTDATA3 * items](#)

4.9.1 Field Documentation

4.9.1.1 INTDATA3* items

Pointer to INTDATA3 items

4.9.1.2 INTDATA num_items

Number of items

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

- [meshlib.h](#)

4.10 mesh_transform Struct Reference

```
#include <meshlib.h>
```

Data Fields

- [FLOATDATA * data](#)

4.10.1 Field Documentation

4.10.1.1 FLOATDATA* data

Matrix data

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

- [meshlib.h](#)

4.11 mesh_vector3 Struct Reference

```
#include <meshlib.h>
```

Data Fields

- [FLOATDATA x](#)
- [FLOATDATA y](#)
- [FLOATDATA z](#)

4.11.1 Field Documentation

4.11.1.1 FLOATDATA x

x co-ordinate

4.11.1.2 FLOATDATA y

y co-ordinate

4.11.1.3 FLOATDATA z

z co-ordinate

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

- [meshlib.h](#)

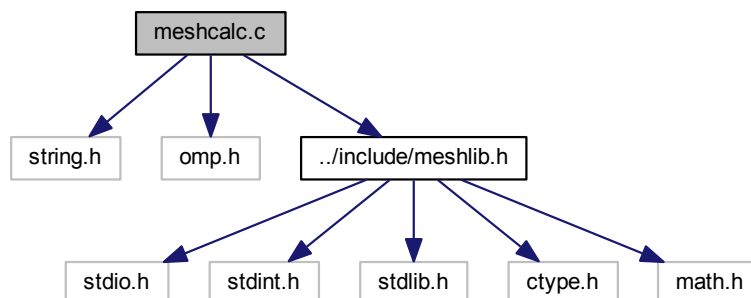
Chapter 5

File Documentation

5.1 meshcalc.c File Reference

This file contains functions pertaining to different mesh computations.

```
#include <string.h>
#include <omp.h>
#include "../include/meshlib.h"
Include dependency graph for meshcalc.c:
```



Functions

- void `mesh_cross_vector3` (`MESH_VECTOR3` x, `MESH_VECTOR3` y, `MESH_VECTOR3` z)
Computes the cross product of two 3-d vectors.
- void `mesh_cross_normal` (`MESH_NORMAL` x, `MESH_NORMAL` y, `MESH_NORMAL` z)
Computes the normalized cross product of two normals.
- void `mesh_calc_face_normal` (`MESH_VERTEX` v1, `MESH_VERTEX` v2, `MESH_VERTEX` v3, `MESH_NORMAL` n)
Computes the face normal given 3 vertices.
- int `mesh_calc_vertex_normals` (`MESH` m)
Computes vertex normals of a given mesh.
- int `mesh_calc_face_normals` (`MESH` m)
Computes face normals of a given mesh.
- int `mesh_calc_edges` (`MESH` m)

- Computes edges of a given mesh.*
- int [mesh_calc_vertex_adjacency](#) (MESH m)
Computes vertex adjacent faces of a given mesh.
- int [mesh_calc_face_adjacency](#) (MESH m)
Computes face adjacent faces of a given mesh.
- INTDATA [mesh_find](#) (MESH_STRUCT s, INTDATA q)
Finds an item in an INTDATA structure.
- INTDATA [mesh_find2](#) (MESH_STRUCT2 s, INTDATA q)
Finds an item in an INTDATA2 structure.
- INTDATA [mesh_find3](#) (MESH_STRUCT3 s, INTDATA q)
Finds an item in an INTDATA3 structure.
- int [mesh_upsample](#) (MESH m, int iters)
Upsamples a given mesh.
- FLOATDATA [mesh_calc_triangle_area](#) (MESH_VERTEX a, MESH_VERTEX b, MESH_VERTEX c)
Computes area of a triangle.

5.1.1 Detailed Description

This file contains functions pertaining to different mesh computations.

Author

Sk. Mohammadul Haque

Version

1.4.2.0

Copyright

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5.1.2 Function Documentation

5.1.2.1 int mesh_calc_edges (MESH m)

Computes edges of a given mesh.

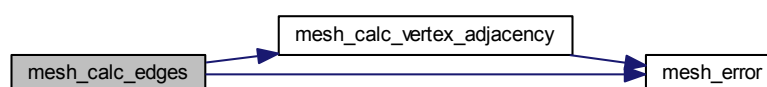
Parameters

in	m	Input mesh
----	---	------------

Returns

Error code

Here is the call graph for this function:



```

graph TD
    mesh_upsample --> mesh_remove_triangles_with_small_area
    mesh_upsample --> mesh_remove_zero_area_faces
    mesh_remove_triangles_with_small_area --> mesh_remove_non_manifold_vertices
    mesh_remove_triangles_with_small_area --> mesh_remove_ear_faces
    mesh_remove_non_manifold_vertices --> mesh_remove_ear_faces
    mesh_remove_non_manifold_vertices --> mesh_remove_unreferenced_vertices
    mesh_remove_zero_area_faces --> mesh_remove_close_vertices
    mesh_remove_close_vertices --> mesh_remove_unreferenced_vertices
    mesh_remove_ear_faces --> mesh_remove_unreferenced_vertices
    mesh_remove_unreferenced_vertices --> mesh_calc_edges
    mesh_calc_face_adjacency --> mesh_remove_ear_faces
    mesh_calc_face_adjacency --> mesh_remove_unreferenced_vertices
    mesh_calc_edges --> mesh_remove_ear_faces
    mesh_calc_edges --> mesh_remove_unreferenced_vertices
  
```

Computes face adjacent faces of a given mesh.

in	m	Input mesh
----	-----	------------

Error code

```

graph LR
    mesh_calc_face_adjacency[mesh_calc_face_adjacency] --> mesh_calc_edges[mesh_calc_edges]
    mesh_calc_face_adjacency --> mesh_error[mesh_error]
    mesh_calc_edges --> mesh_calc_vertex_adjacency[mesh_calc_vertex_adjacency]
    mesh_calc_edges --> mesh_error
    mesh_calc_vertex_adjacency --> mesh_error

```

```
graph LR; A[mesh_remove_close_vertices] --> B[mesh_remove_zero_area_faces]; B --> C[mesh_remove_triangles_with_small_area]; C --> D[mesh_remove_ear_faces]; D --> E[mesh_remove_non_manifold_vertices]; E --> F[mesh_upsample]; F --> G[mesh_calc_face_adjacency];
```

Computes the face normal given 3 vertices.

Parameters

in	$v1$	First vertex
in	$v2$	Second vertex
in	$v3$	Third vertex
out	n	Output face normal \mathbf{n}_f

Returns

NULL

5.1.2.4 int mesh_calc_face_normals (MESH m)

Computes face normals of a given mesh.

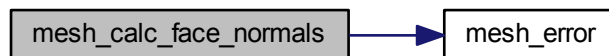
Parameters

in	m	Input mesh
----	-----	------------

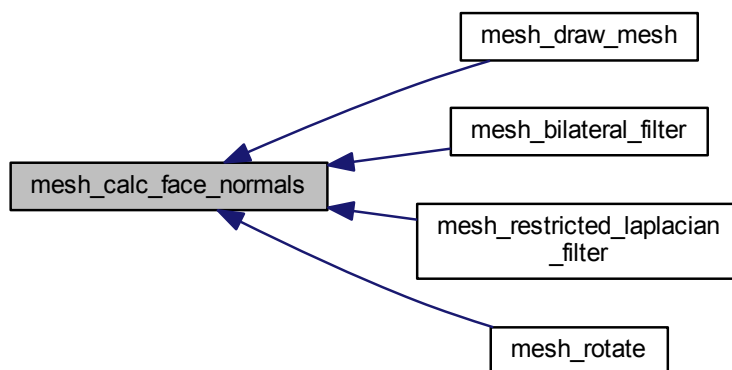
Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



5.1.2.5 `FLOATDATA mesh_calc_triangle_area (MESH_VERTEX a, MESH_VERTEX b, MESH_VERTEX c)`

Computes area of a triangle.

Parameters

in	<i>a</i>	First vertex
in	<i>b</i>	Second vertex
in	<i>c</i>	Third vertex

Returns

Area

Here is the call graph for this function:



Here is the caller graph for this function:

**5.1.2.6 int mesh_calc_vertex_adjacency (MESH *m*)**

Computes vertex adjacent faces of a given mesh.

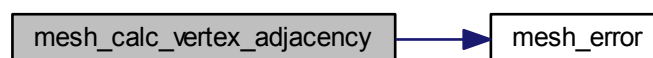
Parameters

in	<i>m</i>	Input mesh
----	----------	------------

Returns

Error code

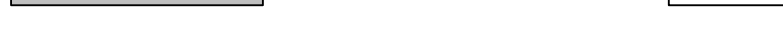
Here is the call graph for this function:



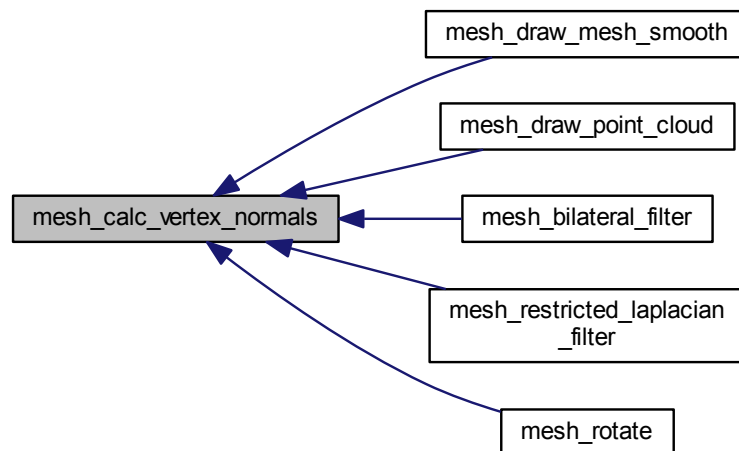
Parameters

[illegible][illegible]

7



Here is the caller graph for this function:



5.1.2.8 `void mesh_cross_normal (MESH_NORMAL x, MESH_NORMAL y, MESH_NORMAL z)`

Computes the normalized cross product of two normals.

Parameters

in	x	First normal
in	y	Second normal
out	z	Output cross product $\frac{\mathbf{x} \times \mathbf{y}}{\ \mathbf{x} \times \mathbf{y}\ _2}$

Returns

NULL

5.1.2.9 `void mesh_cross_vector3 (MESH_VECTOR3 x, MESH_VECTOR3 y, MESH_VECTOR3 z)`

Computes the cross product of two 3-d vectors.

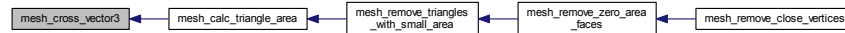
Parameters

in	x	First vector
in	y	Second vector
out	z	Output cross product $\mathbf{x} \times \mathbf{y}$

Returns

NULL

Here is the caller graph for this function:



5.1.2.10 INTDATA mesh_find (MESH_STRUCT s, INTDATA q)

Finds an item in an INTDATA structure.

Parameters

in	s	Input INTDATA structure
in	q	Query INTDATA

Returns

Index or -1

5.1.2.11 INTDATA mesh_find2 (MESH_STRUCT2 s, INTDATA q)

Finds an item in an INTDATA2 structure.

Parameters

in	s	Input INTDATA2 structure
in	q	Query INTDATA2

Returns

Index or -1

5.1.2.12 INTDATA mesh_find3 (MESH_STRUCT3 s, INTDATA q)

Finds an item in an INTDATA3 structure.

Parameters

in	s	Input INTDATA3 structure
in	q	Query INTDATA3

Returns

Index or -1

5.1.2.13 int mesh_upsample (MESH m, int iters)

Upsamples a given mesh.

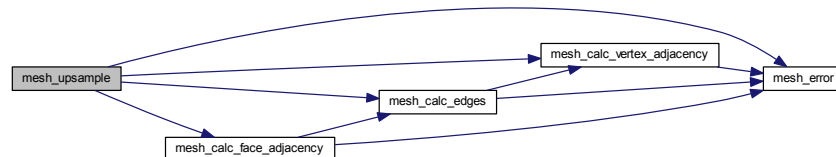
Parameters

in	<i>m</i>	Input mesh
in	<i>iters</i>	Number of iterations

Returns

Error code

Here is the call graph for this function:

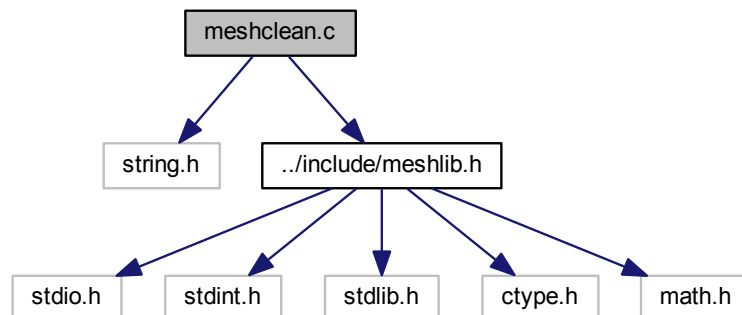


5.2 meshclean.c File Reference

This file contains functions pertaining to different mesh cleaning algorithms.

```
#include <string.h>
#include "../include/meshlib.h"
```

Include dependency graph for meshclean.c:



Functions

- int [mesh_remove_boundary_vertices](#) (MESH m, int iters)
Removes boundary vertices and connecting elements.
- int [mesh_remove_boundary_faces](#) (MESH m, int iters)
Removes boundary faces and connecting elements.
- int [mesh_remove_triangles_with_small_area](#) (MESH m, FLOATDATA area)
Removes triangles with area smaller than a given value.
- int [mesh_remove_zero_area_faces](#) (MESH m)

- Removes triangles with zero area.*
- int [mesh_remove_unreferenced_vertices](#) (MESH *m*)
Removes unreferenced vertices.
- int [mesh_remove_ear_faces](#) (MESH *m*, int *niters*)
Removes ear faces and connecting vertices.
- int [mesh_remove_close_vertices](#) (MESH *m*, FLOATDATA *r*)
Removes close vertices.
- int [mesh_remove_non_manifold_vertices](#) (MESH *m*)
Removes non-manifold vertices.

5.2.1 Detailed Description

This file contains functions pertaining to different mesh cleaning algorithms.

Author

Sk. Mohammadul Haque

Version

1.4.2.0

Copyright

Copyright (c) 2013, 2014, 2015, 2016 Sk. Mohammadul Haque.

5.2.2 Function Documentation

5.2.2.1 int mesh_remove_boundary_faces (MESH *m*, int *iters*)

Removes boundary faces and connecting elements.

Parameters

in	<i>m</i>	Input mesh
in	<i>iters</i>	Number of iterations

Returns

Error code

5.2.2.2 int mesh_remove_boundary_vertices (MESH *m*, int *iters*)

Removes boundary vertices and connecting elements.

Parameters

in	<i>m</i>	Input mesh
in	<i>iters</i>	Number of iterations

Returns

Error code

5.2.2.3 int mesh_remove_close_vertices (MESH *m*, FLOATDATA *r*)

Removes close vertices.

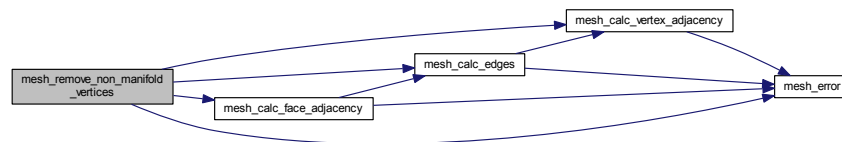
Parameters

<i>in</i>	<i>m</i>	Input mesh
-----------	----------	------------

Returns

Error code

Here is the call graph for this function:

5.2.2.6 int mesh_remove_triangles_with_small_area (MESH *m*, FLOATDATA *area*)

Removes triangles with area smaller than a given value.

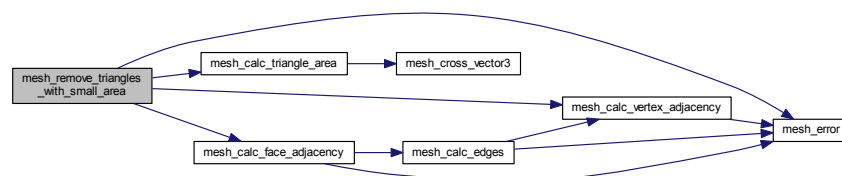
Parameters

<i>in</i>	<i>m</i>	Input mesh
<i>in</i>	<i>area</i>	Given area

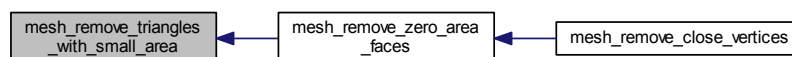
Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:

5.2.2.7 int mesh_remove_unreferenced_vertices (MESH *m*)

Removes unreferenced vertices.

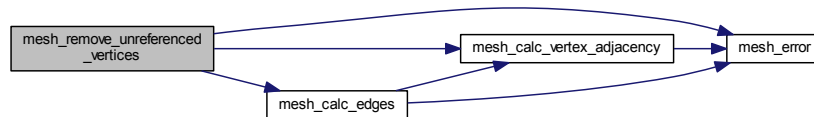
Parameters

in	<i>m</i>	Input mesh
----	----------	------------

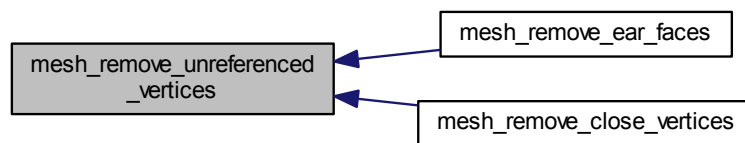
Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



5.2.2.8 int mesh_remove_zero_area_faces (MESH *m*)

Removes triangles with zero area.

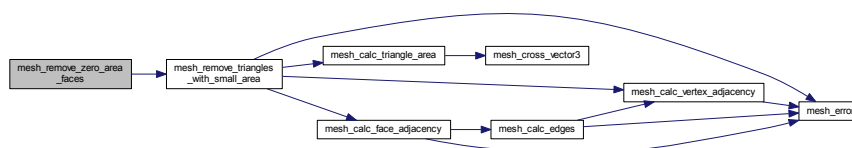
Parameters

in	<i>m</i>	Input mesh
----	----------	------------

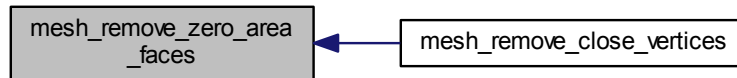
Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:

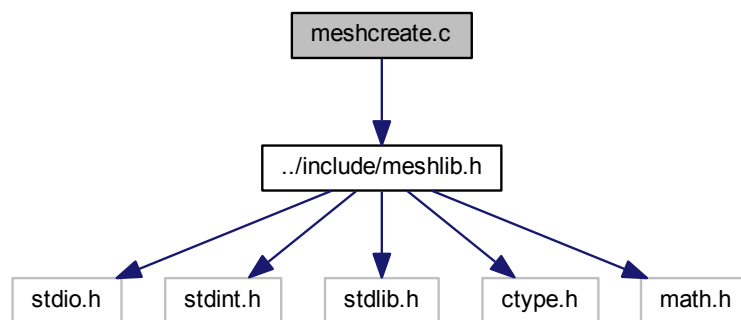


5.3 meshcreate.c File Reference

This file contains functions pertaining to mesh creation and freeing.

```
#include "../include/meshlib.h"
```

Include dependency graph for meshcreate.c:



Functions

- [MESH mesh_create_mesh_new \(\)](#)
Creates a new mesh.
- `void mesh_free_mesh (MESH m)`
Frees a mesh.
- [MESH mesh_create_mesh_new_grid \(MESH_VECTOR3 sz, MESH_VECTOR3 pos, INTDATA m, INTDATA n\)](#)
Creates a grid mesh.
- [MESH mesh_create_mesh_new_cuboid \(MESH_VECTOR3 sz, MESH_VECTOR3 pos\)](#)
Creates a cuboid mesh.
- [MESH mesh_create_mesh_new_ellipsoid \(MESH_VECTOR3 sz, MESH_VECTOR3 pos\)](#)
Creates an ellipsoid mesh.
- [MESH mesh_create_mesh_new_cylinder \(MESH_VECTOR3 sz, MESH_VECTOR3 pos\)](#)
Creates a cylinder mesh.
- [MESH mesh_create_mesh_new_cone \(MESH_VECTOR3 sz, MESH_VECTOR3 pos\)](#)
Creates a cone mesh.

5.3.1 Detailed Description

This file contains functions pertaining to mesh creation and freeing.

Author

Sk. Mohammadul Haque

Version

1.4.2.0

Copyright

Copyright (c) 2013, 2014, 2015, 2016 Sk. Mohammadul Haque.

5.3.2 Function Documentation

5.3.2.1 MESH mesh_create_mesh_new ()

Creates a new mesh.

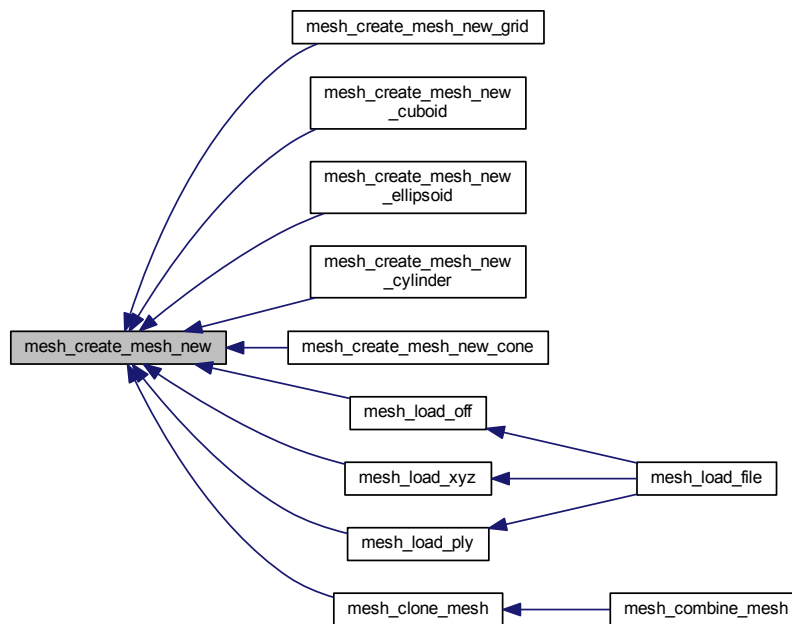
Returns

Output mesh

Here is the call graph for this function:



Here is the caller graph for this function:



5.3.2.2 MESH mesh_create_mesh_new_cone (MESH_VECTOR3 *sz*, MESH_VECTOR3 *pos*)

Creates a cone mesh.

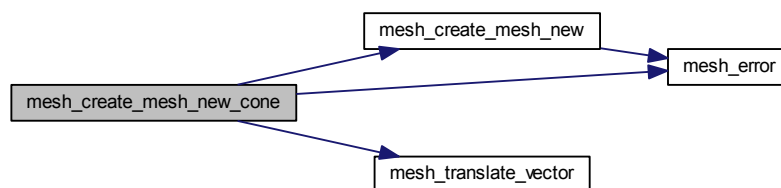
Parameters

in	<i>sz</i>	Size vector
in	<i>pos</i>	Position vector

Returns

Output mesh

Here is the call graph for this function:



5.3.2.3 **MESH** `mesh_create_mesh_new_cuboid (MESH_VECTOR3 sz, MESH_VECTOR3 pos)`

Creates a cuboid mesh.

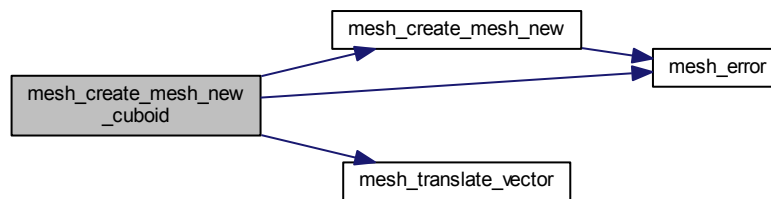
Parameters

in	<i>sz</i>	Size vector
in	<i>pos</i>	Position vector

Returns

Output mesh

Here is the call graph for this function:



5.3.2.4 MESH mesh_create_mesh_new_cylinder (MESH_VECTOR3 *sz*, MESH_VECTOR3 *pos*)

Creates a cylinder mesh.

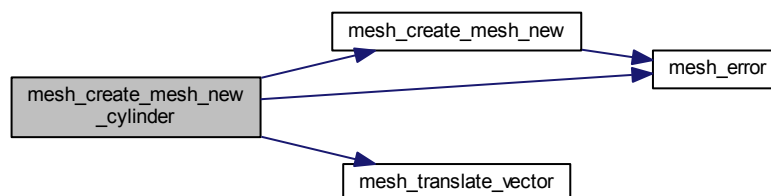
Parameters

in	<i>sz</i>	Size vector
in	<i>pos</i>	Position vector

Returns

Output mesh

Here is the call graph for this function:



5.3.2.5 MESH mesh_create_mesh_new_ellipsoid (MESH_VECTOR3 *sz*, MESH_VECTOR3 *pos*)

Creates an ellipsoid mesh.

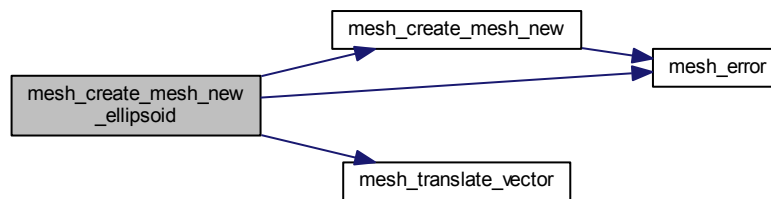
Parameters

in	<i>sz</i>	Size vector
in	<i>pos</i>	Position vector

Returns

Output mesh

Here is the call graph for this function:



5.3.2.6 MESH mesh_create_mesh_new_grid (MESH_VECTOR3 *sz*, MESH_VECTOR3 *pos*, INTDATA *m*, INTDATA *n*)

Creates a grid mesh.

Parameters

in	<i>sz</i>	Size vector
in	<i>pos</i>	Position vector
in	<i>m</i>	Number of x-samples
in	<i>n</i>	Number of y-samples

Returns

Output mesh

Here is the call graph for this function:



5.3.2.7 void mesh_free_mesh (MESH *m*)

Frees a mesh.

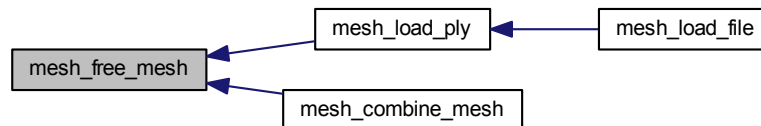
Parameters

<code>in</code>	<code>m</code>	Input mesh
-----------------	----------------	------------

Returns

NULL

Here is the caller graph for this function:

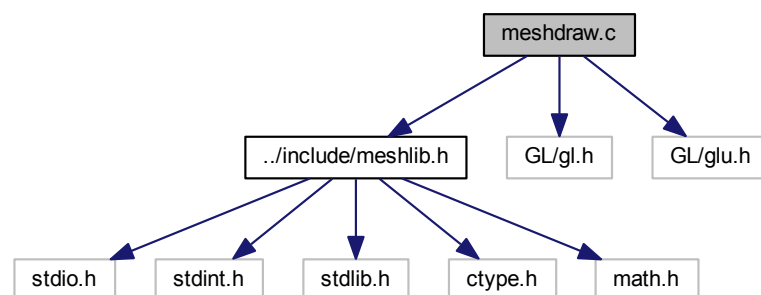


5.4 meshdraw.c File Reference

This file contains functions pertaining to mesh drawing in OpenGL.

```
#include "../include/meshlib.h"
#include <GL/gl.h>
#include <GL/glu.h>
```

Include dependency graph for meshdraw.c:



Functions

- void `mesh_draw_mesh` (MESH m)
Draws a given mesh in OpenGL context in flat shading.
- void `mesh_draw_mesh_smooth` (MESH m)
Draws a given mesh in OpenGL context in smoothing shading.
- void `mesh_draw_point_cloud` (MESH m)
Draws a given mesh in OpenGL context as pointcloud.

5.4.1 Detailed Description

This file contains functions pertaining to mesh drawing in OpenGL.

Author

Sk. Mohammadul Haque

Version

1.4.2.0

Copyright

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5.4.2 Function Documentation

5.4.2.1 void mesh_draw_mesh (MESH *m*)

Draws a given mesh in OpenGL context in flat shading.

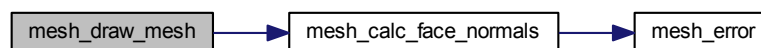
Parameters

<i>in</i>	<i>m</i>	Input mesh
-----------	----------	------------

Returns

NULL

Here is the call graph for this function:



5.4.2.2 void mesh_draw_mesh_smooth (MESH *m*)

Draws a given mesh in OpenGL context in smoothing shading.

Parameters

<i>in</i>	<i>m</i>	Input mesh
-----------	----------	------------

Returns

NULL

Here is the call graph for this function:



5.4.2.3 void mesh_draw_point_cloud (MESH *m*)

Draws a given mesh in OpenGL context as pointcloud.

Parameters

in	<i>m</i>	Input mesh
----	----------	------------

Returns

NULL

Here is the call graph for this function:

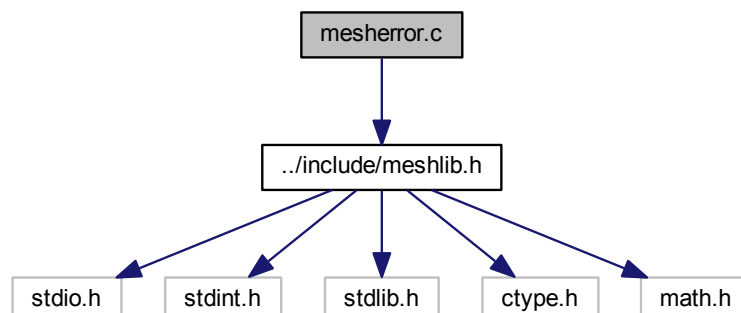


5.5 mesherror.c File Reference

This file contains functions pertaining to handling errors.

```
#include "../include/meshlib.h"
```

Include dependency graph for mesherror.c:



Functions

- void `mesh_error` (int type)

Displays error message and exits.

5.5.1 Detailed Description

This file contains functions pertaining to handling errors.

Author

Sk. Mohammadul Haque

Version

1.4.2.0

Copyright

Copyright (c) 2013, 2014, 2015, 2016 Sk. Mohammadul Haque.

5.5.2 Function Documentation

5.5.2.1 void `mesh_error` (int *type*)

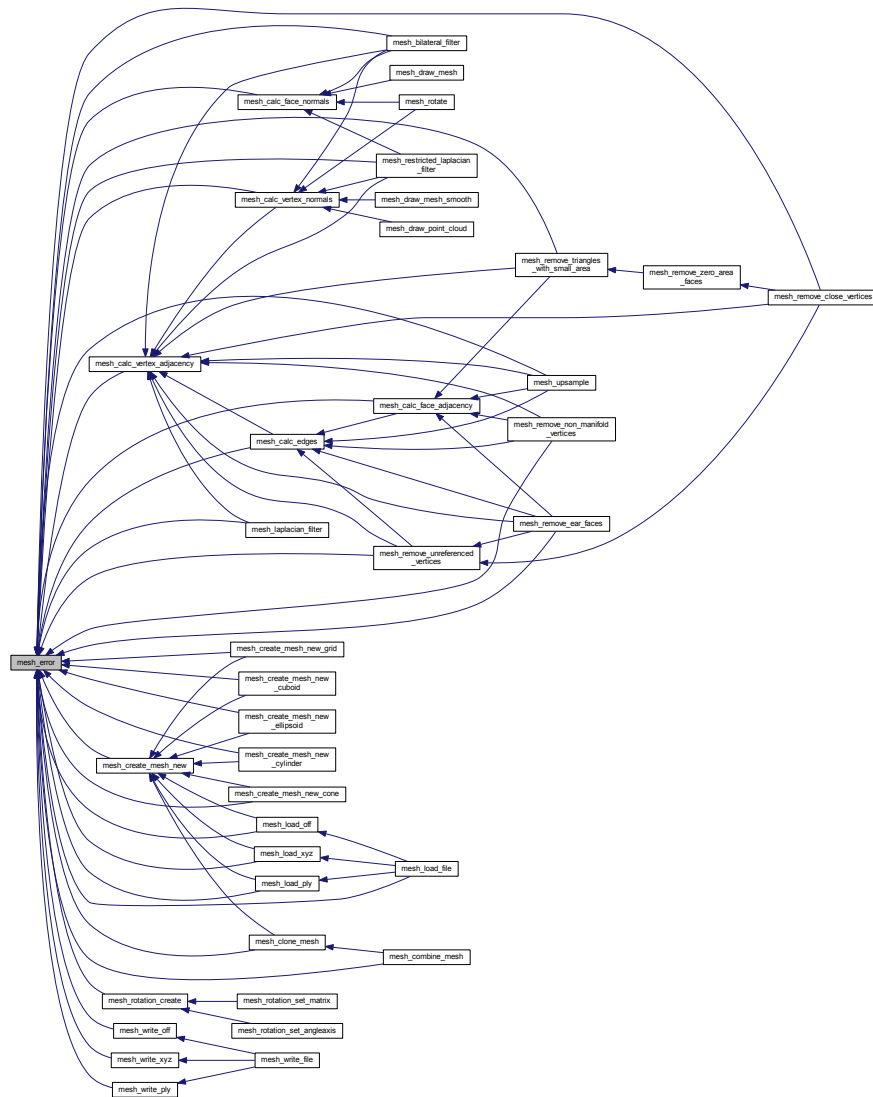
Displays error message and exits.

Parameters

in	type	Error type (MESH_ERR_MALLOC/MESH_ERR_SIZE_MISMATCH/MESH_ERR_FNOTOPEN)
----	------	---

NULL

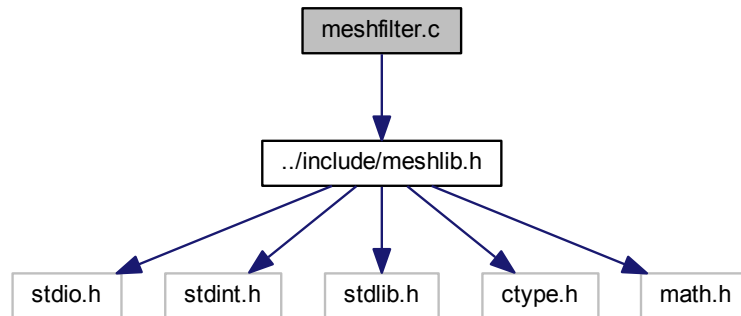
5.6 meshfilter.c File Reference



This file contains functions pertaining to different mesh filtering algorithms.

```
#include "../include/meshlib.h"
```

Include dependency graph for meshfilter.c:



Functions

- int [mesh_bilateral_filter](#) (MESH m, FLOATDATA sigma_c, FLOATDATA sigma_s, int niters)
Mesh bilateral filter.
- int [mesh_laplacian_filter](#) (MESH m, FLOATDATA r)
Mesh Laplacian filter.
- int [mesh_restricted_laplacian_filter](#) (MESH m, FLOATDATA r, FLOATDATA ang)
Restricted Mesh Laplacian filter.

5.6.1 Detailed Description

This file contains functions pertaining to different mesh filtering algorithms.

Author

Sk. Mohammadul Haque

Version

1.4.2.0

Copyright

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5.6.2 Function Documentation

5.6.2.1 int [mesh_bilateral_filter](#) (MESH m, FLOATDATA sigma_c, FLOATDATA sigma_s, int niters)

Mesh bilateral filter.

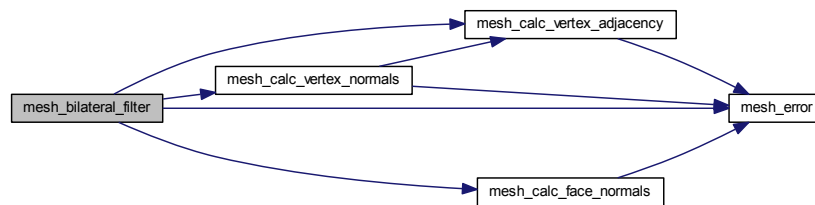
Parameters

in	<i>m</i>	Input mesh
in	<i>sigma_c</i>	Range standard deviation
in	<i>sigma_s</i>	Spatial standard deviation
in	<i>niters</i>	Number of iterations

Returns

Error code

Here is the call graph for this function:

5.6.2.2 int mesh_laplacian_filter (MESH *m*, FLOATDATA *r*)

Mesh Laplacian filter.

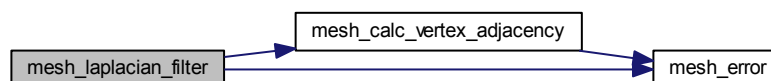
Parameters

in	<i>m</i>	Input mesh
in	<i>r</i>	Amount of diffusion

Returns

Error code

Here is the call graph for this function:

5.6.2.3 int mesh_restricted_laplacian_filter (MESH *m*, FLOATDATA *r*, FLOATDATA *ang*)

Restricted Mesh Laplacian filter.

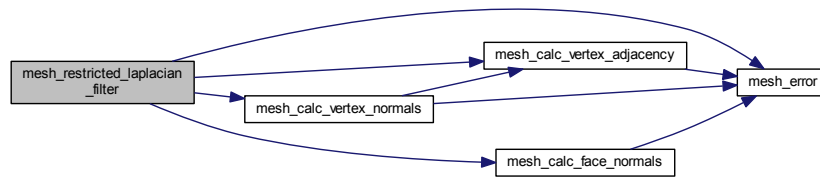
Parameters

in	<i>m</i>	Input mesh
in	<i>r</i>	Amount of diffusion
in	<i>ang</i>	Minimum angle in degrees to suppress filtering

Returns

Error code

Here is the call graph for this function:

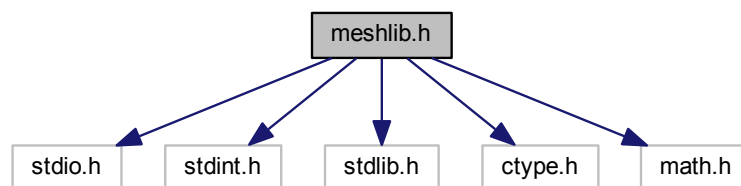


5.7 meshlib.h File Reference

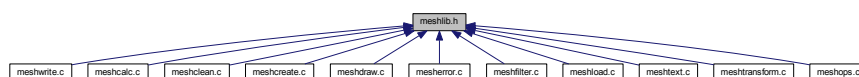
This header file contains declarations of all functions of meshlib.

```
#include <stdio.h>
#include <stdint.h>
#include <stdlib.h>
#include <ctype.h>
#include <math.h>
```

Include dependency graph for meshlib.h:



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



Data Structures

- struct [mesh_vector3](#)
- struct [mesh_color](#)
- struct [mesh_struct](#)
- struct [mesh_struct2](#)
- struct [mesh_struct3](#)
- struct [mesh_face](#)
- struct [mesh_edge](#)
- struct [mesh_adjface](#)
- struct [mesh_rotation](#)
- struct [mesh_transform](#)
- struct [mesh](#)

Macros

- `#define _CRT_SECURE_NO_DEPRECATED`
- `#define MESHLIBAPI extern`
- `#define MESH_INTDATA_TYPE 0`
- `#define MESH_FLOATDATA_TYPE 1`
- `#define INTDATA int32_t /* do not change this, careful see meshload fscanf and other functions */`
- `#define FLOATDATA double /* do not change this, careful see meshload fscanf and other functions */`
- `#define MESH_ORIGIN_TYPE_BUILD 00`
- `#define MESH_ORIGIN_TYPE_OFF 11`
- `#define MESH_ORIGIN_TYPE_NOFF 12`
- `#define MESH_ORIGIN_TYPE_COFF 13`
- `#define MESH_ORIGIN_TYPE_NCOFF 14`
- `#define MESH_ORIGIN_TYPE_XYZ 20`
- `#define MESH_ORIGIN_TYPE_PLY_ASCII 30`
- `#define MESH_ORIGIN_TYPE_PLY_BINARY_LITTLE_ENDIAN 31`
- `#define MESH_ORIGIN_TYPE_PLY_BINARY_BIG_ENDIAN 32`
- `#define MESH_ERR_MALLOC 0`
- `#define MESH_ERR_SIZE_MISMATCH 1`
- `#define MESH_ERR_FNOTOPEN 2`
- `#define MESH_ERR_INCOMPATIBLE 3`
- `#define MESH_ERR_UNKNOWN 4`
- `#define MESH_PI (3.14159265359)`
- `#define MESH_TWOPI (6.28318530718)`
- `#define MESH_CLONE_VERTICES (0x01)`
- `#define MESH_CLONE_VNORMALS (MESH_CLONE_VERTICES | __MESH_CLONE_VNORMALS)`
- `#define MESH_CLONE_VCOLORS (MESH_CLONE_VERTICES | __MESH_CLONE_VCOLORS)`
- `#define MESH_CLONE_VFACES (MESH_CLONE_VERTICES | __MESH_CLONE_VFACES)`
- `#define MESH_CLONE_V_ALL_PROPS (0x0F)`
- `#define MESH_CLONE_FACES (MESH_CLONE_VERTICES | __MESH_CLONE_FACES)`
- `#define MESH_CLONE_FNORMALS (MESH_CLONE_FACES | __MESH_CLONE_FNORMALS)`
- `#define MESH_CLONE_FCOLORS (MESH_CLONE_FACES | __MESH_CLONE_FCOLORS)`
- `#define MESH_CLONE_FAREAS (MESH_CLONE_FACES | __MESH_CLONE_FAREAS)`
- `#define MESH_CLONE_FFACES (MESH_CLONE_FACES | __MESH_CLONE_FFACES)`
- `#define MESH_CLONE_F_ALL_PROPS (MESH_CLONE_FACES | __MESH_CLONE_F_ALL_PROPS)`
- `#define MESH_CLONE_EDGES (MESH_CLONE_VERTICES | __MESH_CLONE_FACES | __MESH_CLONE_EDGES)`
- `#define MESH_CLONE_ALL_PROPS (0xFFFF)`

Typedefs

- typedef struct _iobuf * FILEPOINTER
- typedef INTDATA INTDATA2[2]
- typedef INTDATA INTDATA3[3]
- typedef struct mesh_vector3 mesh_vector3
- typedef mesh_vector3 * MESH_VECTOR3
- typedef mesh_vector3 mesh_vertex
- typedef mesh_vertex * MESH_VERTEX
- typedef mesh_vector3 mesh_normal
- typedef mesh_normal * MESH_NORMAL
- typedef struct mesh_color mesh_color
- typedef mesh_color * MESH_COLOR
- typedef struct mesh_struct mesh_struct
- typedef mesh_struct * MESH_STRUCT
- typedef struct mesh_struct2 mesh_struct2
- typedef mesh_struct2 * MESH_STRUCT2
- typedef struct mesh_struct3 mesh_struct3
- typedef mesh_struct3 * MESH_STRUCT3
- typedef struct mesh_face mesh_face
- typedef mesh_face * MESH_FACE
- typedef struct mesh_edge mesh_edge
- typedef struct mesh_edge * MESH_EDGE
- typedef struct mesh_adjface mesh_adjface
- typedef struct mesh_adjface mesh_vface
- typedef mesh_vface * MESH_VFACE
- typedef struct mesh_adjface mesh_fface
- typedef mesh_fface * MESH_FFACE
- typedef struct mesh_rotation mesh_rotation
- typedef mesh_rotation * MESH_ROTATION
- typedef struct mesh_transform mesh_transform
- typedef mesh_transform * MESH_TRANSFORM
- typedef struct mesh mesh
- typedef mesh * MESH

Functions

- MESHLIBAPI void mesh_error (int type)
Displays error message and exits.
- MESHLIBAPI MESH mesh_create_mesh_new ()
Creates a new mesh.
- MESHLIBAPI void mesh_free_mesh (MESH m)
Frees a mesh.
- MESHLIBAPI MESH mesh_create_mesh_new_grid (MESH_VECTOR3 sz, MESH_VECTOR3 pos, INTDATA m, INTDATA n)
Creates a grid mesh.
- MESHLIBAPI MESH mesh_create_mesh_new_cuboid (MESH_VECTOR3 sz, MESH_VECTOR3 pos)
Creates a cuboid mesh.
- MESHLIBAPI MESH mesh_create_mesh_new_ellipsoid (MESH_VECTOR3 sz, MESH_VECTOR3 pos)
Creates an ellipsoid mesh.
- MESHLIBAPI MESH mesh_create_mesh_new_cylinder (MESH_VECTOR3 sz, MESH_VECTOR3 pos)
Creates a cylinder mesh.
- MESHLIBAPI MESH mesh_create_mesh_new_cone (MESH_VECTOR3 sz, MESH_VECTOR3 pos)

- Creates a cone mesh.*

 - [MESHAPI MESH mesh_clone_mesh](#) ([MESH](#) m, [uint16_t](#) flags)

Clones a given mesh into another mesh.
- [MESHAPI MESH mesh_combine_mesh](#) ([MESH](#) m1, [MESH](#) m2)

Combines a given mesh with another given mesh.
- [MESHAPI MESH mesh_load_file](#) (const char *fname)

Reads a mesh from an OFF/PLY/ASC/XYZ file.
- [MESHAPI MESH mesh_load_off](#) (const char *fname)

Reads a mesh from an OFF file.
- [MESHAPI MESH mesh_load_xyz](#) (const char *fname)

Read a mesh from an ASC/XYZ file.
- [MESHAPI MESH mesh_load_ply](#) (const char *fname)

Reads a mesh from a PLY file.
- [MESHAPI int mesh_write_file](#) ([MESH](#) m, const char *fname)

Write a mesh to an OFF/PLY/ASC/XYZ file.
- [MESHAPI int mesh_write_off](#) ([MESH](#) m, const char *fname)

Write a mesh to an OFF file.
- [MESHAPI int mesh_write_xyz](#) ([MESH](#) m, const char *fname)

Write a mesh to an XYZ file.
- [MESHAPI int mesh_write_ply](#) ([MESH](#) m, const char *fname)

Write a mesh to an PLY file.
- [MESHAPI int mesh_calc_vertex_normals](#) ([MESH](#) m)

Computes vertex normals of a given mesh.
- [MESHAPI int mesh_calc_face_normals](#) ([MESH](#) m)

Computes face normals of a given mesh.
- [MESHAPI int mesh_calc_edges](#) ([MESH](#) m)

Computes edges of a given mesh.
- [MESHAPI int mesh_calc_vertex_adjacency](#) ([MESH](#) m)

Computes vertex adjacent faces of a given mesh.
- [MESHAPI int mesh_calc_face_adjacency](#) ([MESH](#) m)

Computes face adjacent faces of a given mesh.
- [MESHAPI int mesh_upsample](#) ([MESH](#) m, int iters)

Upsamples a given mesh.
- [MESHAPI void mesh_cross_vector3](#) ([MESH_VECTOR3](#) x, [MESH_VECTOR3](#) y, [MESH_VECTOR3](#) z)

Computes the cross product of two 3-d vectors.
- [MESHAPI void mesh_cross_normal](#) ([MESH_NORMAL](#) x, [MESH_NORMAL](#) y, [MESH_NORMAL](#) z)

Computes the normalized cross product of two normals.
- [MESHAPI FLOATDATA mesh_calc_triangle_area](#) ([MESH_VERTEX](#) a, [MESH_VERTEX](#) b, [MESH_VERTEX](#) c)

Computes area of a triangle.
- [MESHAPI void mesh_calc_face_normal](#) ([MESH_VERTEX](#) v1, [MESH_VERTEX](#) v2, [MESH_VERTEX](#) v3, [MESH_NORMAL](#) n)

Computes the face normal given 3 vertices.
- [MESHAPI INTDATA mesh_find](#) ([MESH_STRUCT](#) s, [INTDATA](#) q)

Finds an item in an INTDATA structure.
- [MESHAPI INTDATA mesh_find2](#) ([MESH_STRUCT2](#) s, [INTDATA](#) q)

Finds an item in an INTDATA2 structure.
- [MESHAPI INTDATA mesh_find3](#) ([MESH_STRUCT3](#) s, [INTDATA](#) q)

Finds an item in an INTDATA3 structure.
- [MESHAPI int mesh_remove_boundary_vertices](#) ([MESH](#) m, int iters)

Removes boundary vertices and connecting elements.

- [MESHAPI](#) int [mesh_remove_boundary_faces](#) ([MESH](#) m, int iters)
Removes boundary faces and connecting elements.
- [MESHAPI](#) int [mesh_remove_triangles_with_small_area](#) ([MESH](#) m, [FLOATDATA](#) area)
Removes triangles with area smaller than a given value.
- [MESHAPI](#) int [mesh_remove_unreferenced_vertices](#) ([MESH](#) m)
Removes unreferenced vertices.
- [MESHAPI](#) int [mesh_remove_zero_area_faces](#) ([MESH](#) m)
Removes triangles with zero area.
- [MESHAPI](#) int [mesh_remove_close_vertices](#) ([MESH](#) m, [FLOATDATA](#) r)
Removes close vertices.
- [MESHAPI](#) int [mesh_remove_ear_faces](#) ([MESH](#) m, int niters)
Removes ear faces and connecting vertices.
- [MESHAPI](#) int [mesh_remove_non_manifold_vertices](#) ([MESH](#) m)
Removes non-manifold vertices.
- [MESHAPI](#) int [mesh_isnumeric](#) ([FILEPOINTER](#) fp)
Checks if numeric or not.
- [MESHAPI](#) int [mesh_go_next_word](#) ([FILEPOINTER](#) fp)
Points to the next word.
- [MESHAPI](#) int [mesh_read_word](#) ([FILEPOINTER](#) fp, char *c_word, int sz)
Reads current word and moves to the next word.
- [MESHAPI](#) int [mesh_read_word_only](#) ([FILEPOINTER](#) fp, char *c_word, int sz)
Reads current word without moving to the next word.
- [MESHAPI](#) int [mesh_count_words_in_line](#) ([FILEPOINTER](#) fp, int *count)
Counts number of words in the current line.
- [MESHAPI](#) int [mesh_skip_line](#) ([FILEPOINTER](#) fp)
Skips to next line.
- [MESHAPI](#) int [mesh_bilateral_filter](#) ([MESH](#) m, [FLOATDATA](#) sigma_c, [FLOATDATA](#) sigma_s, int niters)
Mesh bilateral filter.
- [MESHAPI](#) int [mesh_laplacian_filter](#) ([MESH](#) m, [FLOATDATA](#) r)
Mesh Laplacian filter.
- [MESHAPI](#) int [mesh_restricted_laplacian_filter](#) ([MESH](#) m, [FLOATDATA](#) r, [FLOATDATA](#) ang)
Restricted Mesh Laplacian filter.
- [MESHAPI](#) [MESH_ROTATION](#) [mesh_rotation_create](#) ()
Creates a new rotation.
- [MESHAPI](#) void [mesh_rotation_free](#) ([MESH_ROTATION](#) r)
Frees a given rotation.
- [MESHAPI](#) [MESH_ROTATION](#) [mesh_rotation_set_matrix](#) ([FLOATDATA](#) *mat, [MESH_ROTATION](#) r)
Sets rotation from a matrix.
- [MESHAPI](#) [MESH_ROTATION](#) [mesh_rotation_set_angleaxis](#) ([FLOATDATA](#) ang, [MESH_NORMAL](#) axis, [MESH_ROTATION](#) r)
Sets rotation from angle axis.
- [MESHAPI](#) int [mesh_translate](#) ([MESH](#) m, [FLOATDATA](#) x, [FLOATDATA](#) y, [FLOATDATA](#) z)
Translates a mesh by x, y and z amounts.
- [MESHAPI](#) int [mesh_translate_vector](#) ([MESH](#) m, [MESH_VERTEX](#) v)
Translates a mesh by a given 3-d vector.
- [MESHAPI](#) int [mesh_scale](#) ([MESH](#) m, [FLOATDATA](#) sx, [FLOATDATA](#) sy, [FLOATDATA](#) sz)
Scales a mesh by x, y and z amounts.
- [MESHAPI](#) [MESH_VERTEX](#) [mesh_vertex_rotate](#) ([MESH_VERTEX](#) v, [MESH_ROTATION](#) r)
Rotates a vertex by a given rotation.
- [MESHAPI](#) int [mesh_rotate](#) ([MESH](#) m, [MESH_ROTATION](#) r)
Rotates a mesh by a given rotation.

- **MESHLIBAPI** void `mesh_draw_mesh` (**MESH** m)
Draws a given mesh in OpenGL context in flat shading.
- **MESHLIBAPI** void `mesh_draw_mesh_smooth` (**MESH** m)
Draws a given mesh in OpenGL context in smoothing shading.
- **MESHLIBAPI** void `mesh_draw_point_cloud` (**MESH** m)
Draws a given mesh in OpenGL context as pointcloud.

5.7.1 Detailed Description

This header file contains declarations of all functions of meshlib.

Author

Sk. Mohammadul Haque

Version

1.4.2.0

Copyright

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5.7.2 Macro Definition Documentation

5.7.2.1 `#define _CRT_SECURE_NO_DEPRECATED`

5.7.2.2 `#define FLOATDATA double /* do not change this, careful see meshload fscanf and other functions */`

Float datatype

5.7.2.3 `#define INTDATA int32_t /* do not change this, careful see meshload fscanf and other functions */`

Integer datatype

5.7.2.4 `#define MESH_CLONE_ALL_PROPS (0xFFFF)`

Clone mesh all properties

5.7.2.5 `#define MESH_CLONE_EDGES (MESH_CLONE_VERTICES | __MESH_CLONE_FACES | __MESH_CLONE_EDGES)`

Clone mesh edges

5.7.2.6 `#define MESH_CLONE_F_ALL_PROPS (MESH_CLONE_FACES | __MESH_CLONE_F_ALL_PROPS)`

Clone mesh all face properties

5.7.2.7 `#define MESH_CLONE_FACES (MESH_CLONE_VERTICES | __MESH_CLONE_FACES)`

Clone mesh faces

5.7.2.8 #define MESH_CLONE_FAREAS (MESH_CLONE_FACES | __MESH_CLONE_FAREAS)

Clone mesh faces and face areas

5.7.2.9 #define MESH_CLONE_FCOLORS (MESH_CLONE_FACES | __MESH_CLONE_FCOLORS)

Clone mesh faces and face colors

5.7.2.10 #define MESH_CLONE_FFACES (MESH_CLONE_FACES | __MESH_CLONE_FFACES)

Clone mesh faces and face face adjacency

5.7.2.11 #define MESH_CLONE_FNORMALS (MESH_CLONE_FACES | __MESH_CLONE_FNORMALS)

Clone mesh faces and face normals

5.7.2.12 #define MESH_CLONE_V_ALL_PROPS (0x0F)

Clone mesh all vertex properties

5.7.2.13 #define MESH_CLONE_VCOLORS (MESH_CLONE_VERTICES | __MESH_CLONE_VCOLORS)

Clone mesh vertices and vertex colors

5.7.2.14 #define MESH_CLONE_VERTICES (0x01)

Clone mesh vertices

5.7.2.15 #define MESH_CLONE_VFACES (MESH_CLONE_VERTICES | __MESH_CLONE_VFACES)

Clone mesh vertices and vertex face adjacency

5.7.2.16 #define MESH_CLONE_VNORMALS (MESH_CLONE_VERTICES | __MESH_CLONE_VNORMALS)

Clone mesh vertices and vertex normals

5.7.2.17 #define MESH_ERR_FNOTOPEN 2

Mesh error type - file open

5.7.2.18 #define MESH_ERR_INCOMPATIBLE 3

Mesh error type - incompatible data

5.7.2.19 #define MESH_ERR_MALLOC 0

Mesh error type - allocation

5.7.2.20 #define MESH_ERR_SIZE_MISMATCH 1

Mesh error type - size mismatch

5.7.2.21 #define MESH_ERR_UNKNOWN 4

Mesh error type - unknown

5.7.2.22 #define MESH_FLOATDATA_TYPE 1

Float datatype selector

5.7.2.23 #define MESH_INTDATA_TYPE 0

Integer datatype selector

5.7.2.24 #define MESH_ORIGIN_TYPE_BUILD 00

Mesh origin type - create new

5.7.2.25 #define MESH_ORIGIN_TYPE_COFF 13

Mesh origin type - COFF file

5.7.2.26 #define MESH_ORIGIN_TYPE_NCOFF 14

Mesh origin type - NCOFF file

5.7.2.27 #define MESH_ORIGIN_TYPE_NOFF 12

Mesh origin type - NOFF file

5.7.2.28 #define MESH_ORIGIN_TYPE_OFF 11

Mesh origin type - OFF file

5.7.2.29 #define MESH_ORIGIN_TYPE_PLY_ASCII 30

Mesh origin type - PLY ascii file

5.7.2.30 #define MESH_ORIGIN_TYPE_PLY_BINARY_BIG_ENDIAN 32

Mesh origin type - PLY binary BE file

5.7.2.31 #define MESH_ORIGIN_TYPE_PLY_BINARY_LITTLE_ENDIAN 31

Mesh origin type - PLY binary LE file

5.7.2.32 `#define MESH_ORIGIN_TYPE_XYZ 20`

Mesh origin type - XYZ file

5.7.2.33 `#define MESH_PI (3.14159265359)`

π

5.7.2.34 `#define MESH_TWOPI (6.28318530718)`

2π

5.7.2.35 `#define MESHLIBAPI extern`

5.7.3 Typedef Documentation

5.7.3.1 `typedef struct _iobuf* FILEPOINTER`

File pointer

5.7.3.2 `typedef INTDATA INTDATA2[2]`

2- element INTDATA

5.7.3.3 `typedef INTDATA INTDATA3[3]`

3- element INTDATA

5.7.3.4 `typedef struct mesh mesh`

Mesh

5.7.3.5 `typedef mesh* MESH`

Pointer to mesh

5.7.3.6 `typedef struct mesh_adjface mesh_adjface`

Adjacent face structure

5.7.3.7 `typedef struct mesh_color mesh_color`

5.7.3.8 `typedef mesh_color* MESH_COLOR`

Color

5.7.3.9 `typedef struct mesh_edge mesh_edge`

Edge

5.7.3.10 `typedef struct mesh_edge* MESH_EDGE`

Pointer to edge

5.7.3.11 `typedef struct mesh_face mesh_face`

Face

5.7.3.12 `typedef mesh_face* MESH_FACE`

Pointer to face

5.7.3.13 `typedef struct mesh_adjface mesh_fface`

Face adjacent faces

5.7.3.14 `typedef mesh_fface* MESH_FFACE`

Pointer to face adjacent faces

5.7.3.15 `typedef mesh_vector3 mesh_normal`

Normal

5.7.3.16 `typedef mesh_normal* MESH_NORMAL`

Normal pointer

5.7.3.17 `typedef struct mesh_rotation mesh_rotation`

Rotation

5.7.3.18 `typedef mesh_rotation* MESH_ROTATION`

Pointer to rotation

5.7.3.19 `typedef struct mesh_struct mesh_struct`

INTDATA Structure

5.7.3.20 `typedef mesh_struct* MESH_STRUCT`

INTDATA Structure pointer

5.7.3.21 `typedef struct mesh_struct2 mesh_struct2`

INTDATA2 Structure

5.7.3.22 `typedef mesh_struct2* MESH_STRUCT2`

INTDATA2 Structure pointer

5.7.3.23 `typedef struct mesh_struct3 mesh_struct3`

INTDATA3 Structure

5.7.3.24 `typedef mesh_struct3* MESH_STRUCT3`

INTDATA3 Structure pointer

5.7.3.25 `typedef struct mesh_transform mesh_transform`

Transformation

5.7.3.26 `typedef mesh_transform* MESH_TRANSFORM`

Pointer to transformation

5.7.3.27 `typedef struct mesh_vector3 mesh_vector3`

Generic 3-d vector

5.7.3.28 `typedef mesh_vector3* MESH_VECTOR3`

Generic 3-d vector pointer

5.7.3.29 `typedef mesh_vector3 mesh_vertex`

Vertex

5.7.3.30 `typedef mesh_vertex* MESH_VERTEX`

Vertex pointer

5.7.3.31 `typedef struct mesh_adjface mesh_vface`

Vertex adjacent faces

5.7.3.32 `typedef mesh_vface* MESH_VFACE`

Pointer to vertex adjacent faces

5.7.4 Function Documentation

5.7.4.1 **MESHLIBAPI** `int mesh_bilateral_filter (MESH m, FLOATDATA sigma_c, FLOATDATA sigma_s, int niters)`

Mesh bilateral filter.

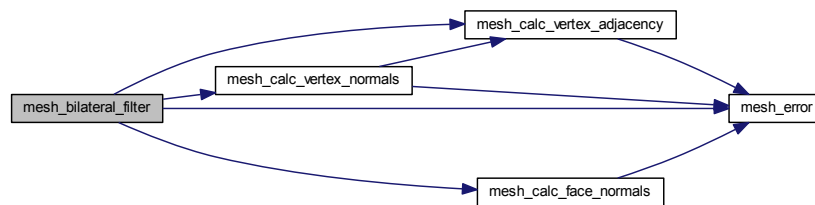
Parameters

in	<i>m</i>	Input mesh
in	<i>sigma_c</i>	Range standard deviation
in	<i>sigma_s</i>	Spatial standard deviation
in	<i>niters</i>	Number of iterations

Returns

Error code

Here is the call graph for this function:

5.7.4.2 MESHAPI int mesh_calc_edges (MESH *m*)

Computes edges of a given mesh.

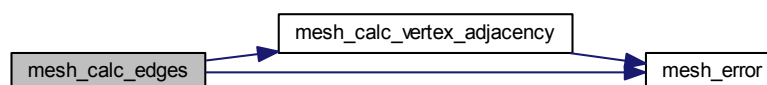
Parameters

in	<i>m</i>	Input mesh
----	----------	------------

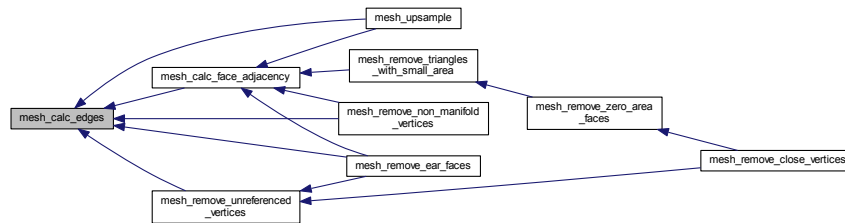
Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.3 MESHAPI int mesh_calc_face_adjacency (MESH m)

Computes face adjacent faces of a given mesh.

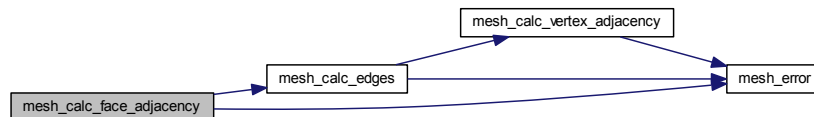
Parameters

in	<i>m</i>	Input mesh
----	----------	------------

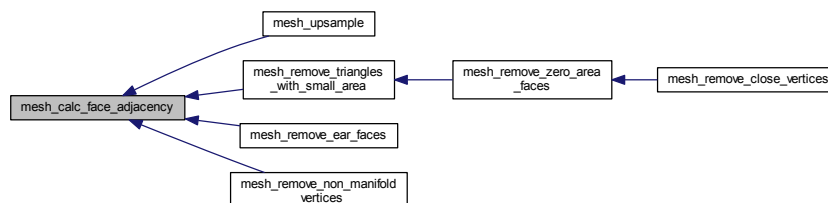
Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.4 MESHAPI void mesh_calc_face_normal (MESH_VERTEX v1, MESH_VERTEX v2, MESH_VERTEX v3, MESH_NORMAL n)

Computes the face normal given 3 vertices.

Parameters

in	$v1$	First vertex
in	$v2$	Second vertex
in	$v3$	Third vertex
out	n	Output face normal \mathbf{n}_f

Returns

NULL

5.7.4.5 MESHLIBAPI int mesh_calc_face_normals (MESH m)

Computes face normals of a given mesh.

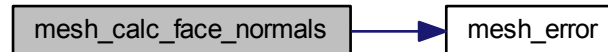
Parameters

in	m	Input mesh
----	-----	------------

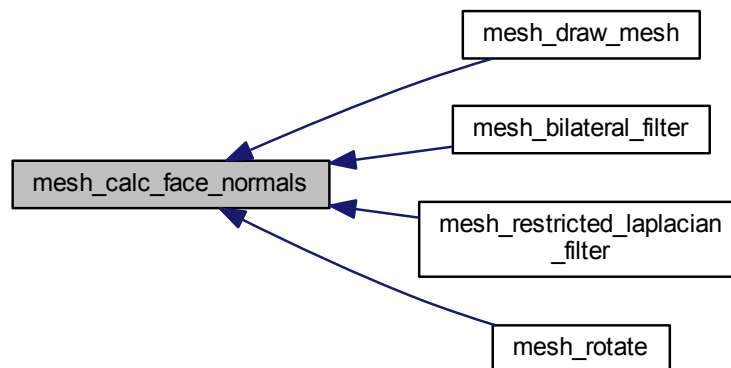
Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.6 MESHAPI FLOATDATA mesh_calc_triangle_area (MESH_VERTEX *a*, MESH_VERTEX *b*,
MESH_VERTEX *c*)

Computes area of a triangle.

Parameters

in	<i>a</i>	First vertex
in	<i>b</i>	Second vertex
in	<i>c</i>	Third vertex

Returns

Area

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.7 MESHAPI int mesh_calc_vertex_adjacency (MESH *m*)

Computes vertex adjacent faces of a given mesh.

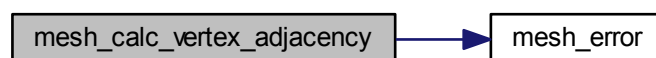
Parameters

in	<i>m</i>	Input mesh
----	----------	------------

Returns

Error code

Here is the call graph for this function:



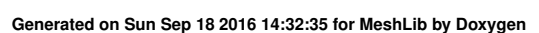
[illegible]

Computes vertex normals of a given mesh.

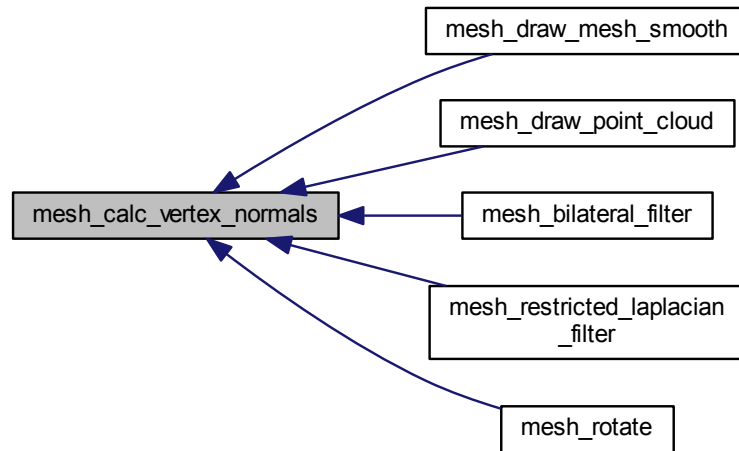
Parameters		
in	m	Input mesh

Error code

```
graph LR; A[mesh_calc_vertex_normals] --> B[mesh_calc_vertex_adjacency]; B --> C[mesh_error]; A --> C;
```



Here is the caller graph for this function:



5.7.4.9 MESHAPI MESH mesh_clone_mesh (MESH *m*, uint16_t *flags*)

Clones a given mesh into another mesh.

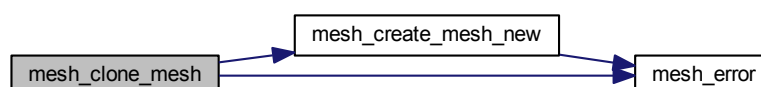
Parameters

in	<i>m</i>	Input mesh to clone
in	<i>flags</i>	Flags to copy which properties (MESH_CLONE_VERTICES/MESH_CLONE_VNORMALS/MESH_CLONE_VCOLORS/MESH_CLONE_VFACES/MESH_CLONE_VALL_PROPS/MESH_CLONE_FACES/MESH_CLONE_FNORMALS/MESH_CLONE_FCOLORS/MESH_CLONE_FAREAS/MESH_CLONE_FALL_PROPS/MESH_CLONE_ALL_PROPS)

Returns

Output cloned mesh

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.10 MESHAPI MESH mesh_combine_mesh (MESH *m1*, MESH *m2*)

Combines a given mesh with another given mesh.

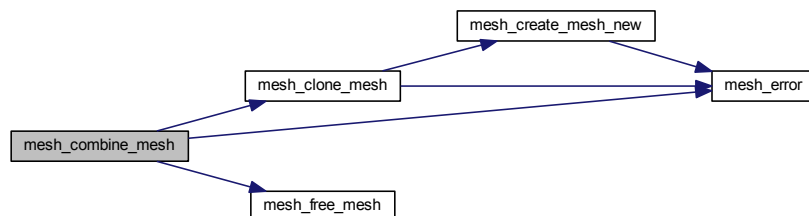
Parameters

in	<i>m1</i>	Input mesh to combine with
in	<i>m2</i>	Input mesh to combine

Returns

Output combined mesh

Here is the call graph for this function:



5.7.4.11 MESHAPI int mesh_count_words_in_line (FILEPOINTER *fp*, int * *count*)

Counts number of words in the current line.

Parameters

in	<i>fp</i>	Pointer to input file
out	<i>count</i>	Count

Returns

Status 0 - Normal/ 1- EOF

5.7.4.12 MESHAPI MESH mesh_create_mesh_new ()

Creates a new mesh.

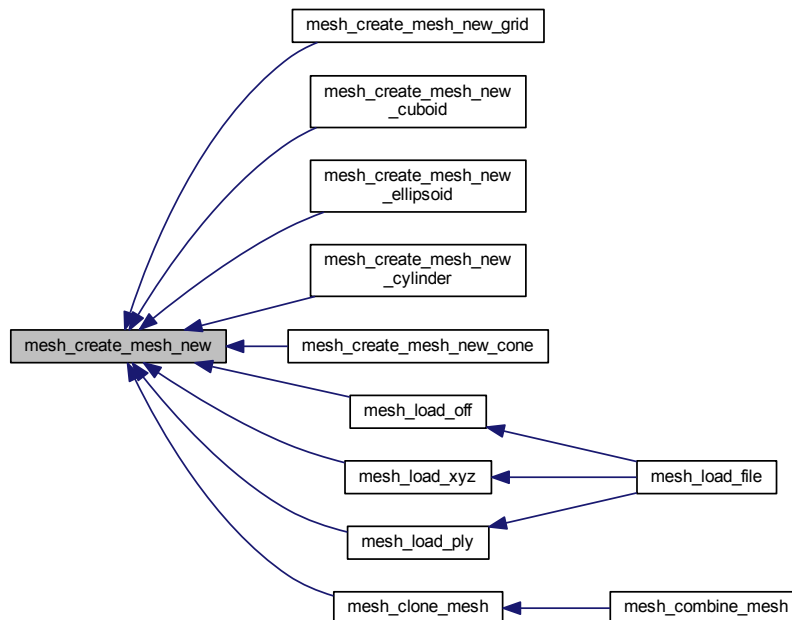
Returns

Output mesh

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.13 MESHAPI MESH mesh_create_mesh_new_cone (MESH_VECTOR3 sz, MESH_VECTOR3 pos)

Creates a cone mesh.

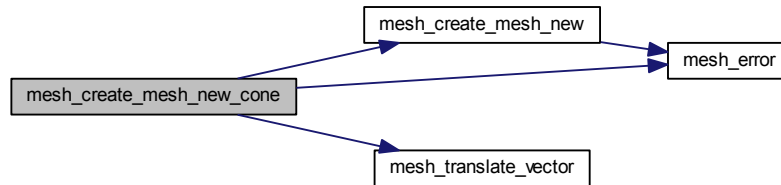
Parameters

<i>in</i>	<i>sz</i>	Size vector
<i>in</i>	<i>pos</i>	Position vector

Returns

Output mesh

Here is the call graph for this function:



5.7.4.14 MESHAPI MESH mesh_create_mesh_new_cuboid (MESH_VECTOR3 sz, MESH_VECTOR3 pos)

Creates a cuboid mesh.

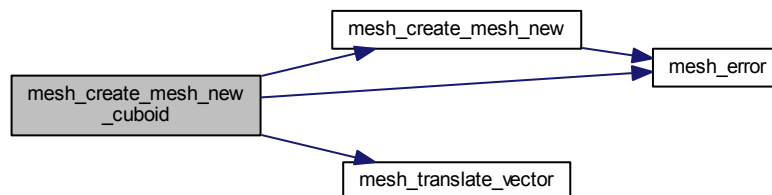
Parameters

in	sz	Size vector
in	pos	Position vector

Returns

Output mesh

Here is the call graph for this function:



5.7.4.15 MESHAPI MESH mesh_create_mesh_new_cylinder (MESH_VECTOR3 sz, MESH_VECTOR3 pos)

Creates a cylinder mesh.

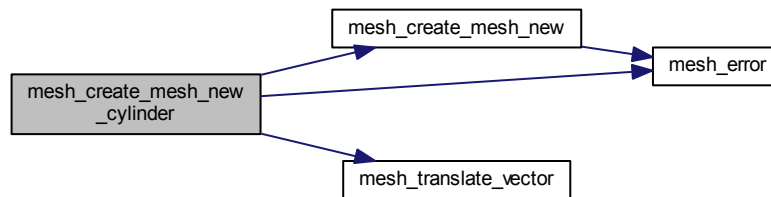
Parameters

in	<i>sz</i>	Size vector
in	<i>pos</i>	Position vector

Returns

Output mesh

Here is the call graph for this function:



5.7.4.16 MESHAPI MESH mesh_create_mesh_new_ellipsoid (MESH_VECTOR3 *sz*, MESH_VECTOR3 *pos*)

Creates an ellipsoid mesh.

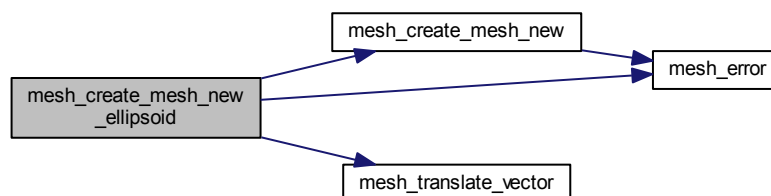
Parameters

in	<i>sz</i>	Size vector
in	<i>pos</i>	Position vector

Returns

Output mesh

Here is the call graph for this function:



5.7.4.17 MESHAPI MESH mesh_create_mesh_new_grid (MESH_VECTOR3 *sz*, MESH_VECTOR3 *pos*, INTDATA *m*, INTDATA *n*)

Creates a grid mesh.

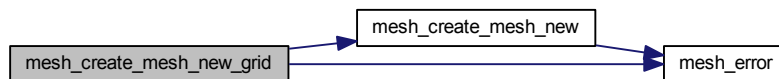
Parameters

in	<i>sz</i>	Size vector
in	<i>pos</i>	Position vector
in	<i>m</i>	Number of x-samples
in	<i>n</i>	Number of y-samples

Returns

Output mesh

Here is the call graph for this function:



5.7.4.18 MESHLIBAPI void mesh_cross_normal (MESH_NORMAL x, MESH_NORMAL y, MESH_NORMAL z)

Computes the normalized cross product of two normals.

Parameters

in	<i>x</i>	First normal
in	<i>y</i>	Second normal
out	<i>z</i>	Output cross product $\frac{\mathbf{x} \times \mathbf{y}}{\ \mathbf{x} \times \mathbf{y}\ _2}$

Returns

NULL

5.7.4.19 MESHLIBAPI void mesh_cross_vector3 (MESH_VECTOR3 x, MESH_VECTOR3 y, MESH_VECTOR3 z)

Computes the cross product of two 3-d vectors.

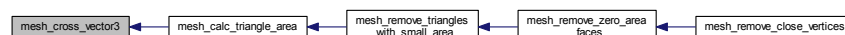
Parameters

in	<i>x</i>	First vector
in	<i>y</i>	Second vector
out	<i>z</i>	Output cross product $\mathbf{x} \times \mathbf{y}$

Returns

NULL

Here is the caller graph for this function:



5.7.4.20 MESHAPI void mesh_draw_mesh (MESH *m*)

Draws a given mesh in OpenGL context in flat shading.

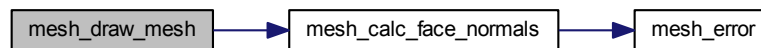
Parameters

<i>in</i>	<i>m</i>	Input mesh
-----------	----------	------------

Returns

NULL

Here is the call graph for this function:



5.7.4.21 MESHAPI void mesh_draw_mesh_smooth (MESH *m*)

Draws a given mesh in OpenGL context in smoothing shading.

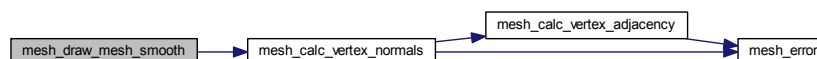
Parameters

<i>in</i>	<i>m</i>	Input mesh
-----------	----------	------------

Returns

NULL

Here is the call graph for this function:



5.7.4.22 MESHAPI void mesh_draw_point_cloud (MESH *m*)

Draws a given mesh in OpenGL context as pointcloud.

Parameters

<i>in</i>	<i>m</i>	Input mesh
-----------	----------	------------

Returns

NULL

Here is the call graph for this function:



5.7.4.23 MESHLIBAPI void mesh_error (int type)

Displays error message and exits.

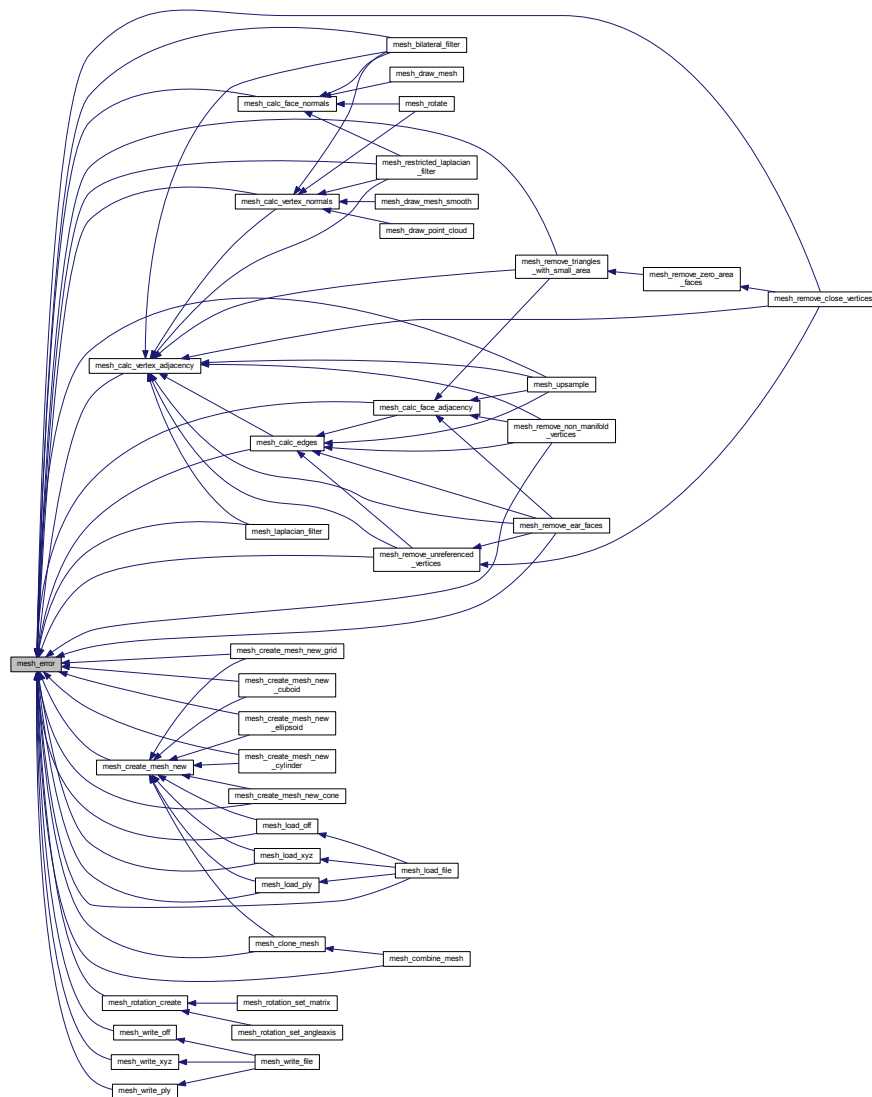
Parameters

	<i>type</i>	
in		Error type (MESH_ERR_MALLOC/MESH_ERR_SIZE_MISMATCH/MESH_ERR_FNOTOPEN)

Returns

NULL

Here is the caller graph for this function:



5.7.4.24 MESHAPI INTDATA mesh_find (MESH_STRUCT s, INTDATA q)

Finds an item in an INTDATA structure.

Parameters

in	s	Input INTDATA structure
in	q	Query INTDATA

Returns

Index or -1

5.7.4.25 MESHAPI INTDATA mesh_find2 (MESH_STRUCT2 s, INTDATA q)

Finds an item in an INTDATA2 structure.

Parameters

in	<i>s</i>	Input INTDATA2 structure
in	<i>q</i>	Query INTDATA2

Returns

Index or -1

5.7.4.26 MESHLIBAPI INTDATA mesh_find3 (MESH_STRUCT3 *s*, INTDATA *q*)

Finds an item in an INTDATA3 structure.

Parameters

in	<i>s</i>	Input INTDATA3 structure
in	<i>q</i>	Query INTDATA3

Returns

Index or -1

5.7.4.27 MESHLIBAPI void mesh_free_mesh (MESH *m*)

Frees a mesh.

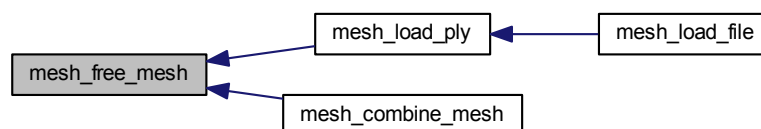
Parameters

in	<i>m</i>	Input mesh
----	----------	------------

Returns

NULL

Here is the caller graph for this function:



5.7.4.28 MESHLIBAPI int mesh_go_next_word (FILEPOINTER *fp*)

Points to the next word.

Parameters

<i>in</i>	<i>fp</i>	Pointer to input file
-----------	-----------	-----------------------

Returns

Status 0 - Normal/ 1- EOF

5.7.4.29 MESHLIBAPI int mesh_isnumeric (FILEPOINTER *fp*)

Checks if numeric or not.

Parameters

<i>in</i>	<i>fp</i>	Pointer to input file
-----------	-----------	-----------------------

Returns

1 for numeric/ else - for non-numeric

5.7.4.30 MESHLIBAPI int mesh_laplacian_filter (MESH *m*, FLOATDATA *r*)

Mesh Laplacian filter.

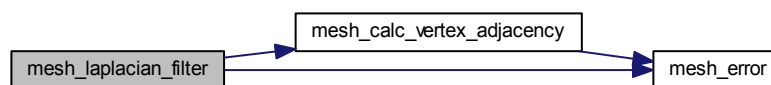
Parameters

<i>in</i>	<i>m</i>	Input mesh
<i>in</i>	<i>r</i>	Amount of diffusion

Returns

Error code

Here is the call graph for this function:

**5.7.4.31 MESHLIBAPI MESH mesh_load_file (const char * *fname*)**

Reads a mesh from an OFF/PLY/ASC/XYZ file.

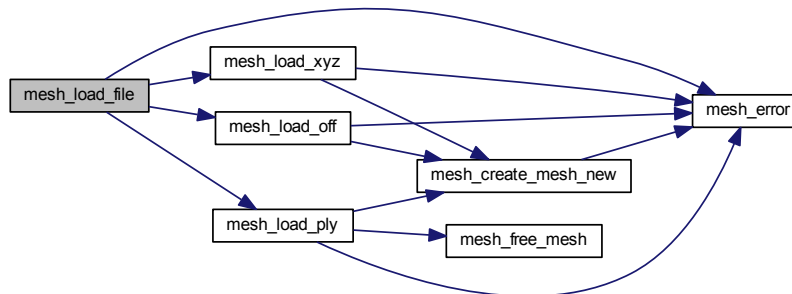
Parameters

<i>in</i>	<i>fname</i>	Input filename
-----------	--------------	----------------

Returns

Output mesh

Here is the call graph for this function:



5.7.4.32 MESHAPI MESH mesh_load_off (const char * *fname*)

Reads a mesh from an OFF file.

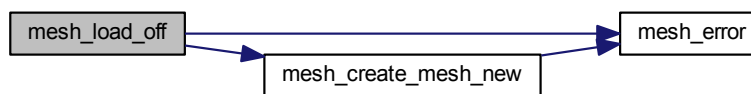
Parameters

<i>in</i>	<i>fname</i>	Input filename
-----------	--------------	----------------

Returns

Output mesh

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.33 MESHAPI MESH mesh_load_ply (const char * *fname*)

Reads a mesh from a PLY file.

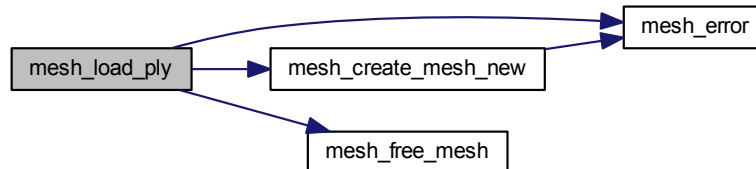
Parameters

<i>in</i>	<i>fname</i>	Input filename
-----------	--------------	----------------

Returns

Output mesh

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.34 MESHAPI MESH mesh_load_xyz (const char * *fname*)

Read a mesh from an ASC/XYZ file.

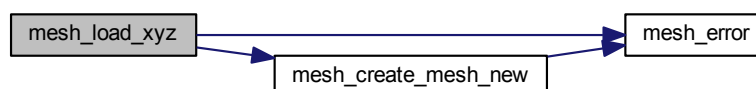
Parameters

<i>in</i>	<i>fname</i>	Input filename
-----------	--------------	----------------

Returns

Output mesh

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.35 MESHLIBAPI int mesh_read_word (FILEPOINTER *fp*, char * *c_word*, int *sz*)

Reads current word and moves to the next word.

Parameters

in	<i>fp</i>	Pointer to input file
out	<i>c_word</i>	Variable to store the word
in	<i>sz</i>	Maximum size to read

Returns

Status 0 - Normal/ 1- EOF

5.7.4.36 MESHLIBAPI int mesh_read_word_only (FILEPOINTER *fp*, char * *c_word*, int *sz*)

Reads current word without moving to the next word.

Parameters

in	<i>fp</i>	Pointer to input file
out	<i>c_word</i>	Variable to store the word
in	<i>sz</i>	Maximum size to read

Returns

Status 0 - Normal/ 1- EOF

5.7.4.37 MESHLIBAPI int mesh_remove_boundary_faces (MESH *m*, int *iters*)

Removes boundary faces and connecting elements.

Parameters

in	<i>m</i>	Input mesh
in	<i>iters</i>	Number of iterations

Returns

Error code

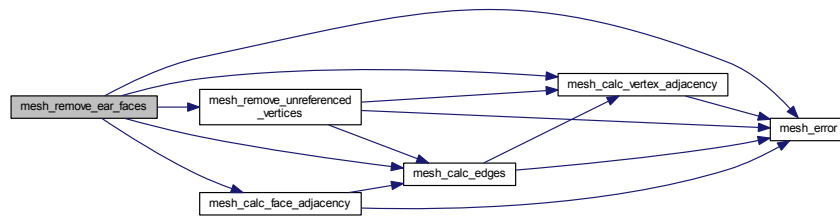
5.7.4.38 MESHLIBAPI int mesh_remove_boundary_vertices (MESH *m*, int *iters*)

Removes boundary vertices and connecting elements.

Returns

Error code

Here is the call graph for this function:



5.7.4.41 MESHLIBAPI int mesh_remove_non_manifold_vertices (MESH *m*)

Removes non-manifold vertices.

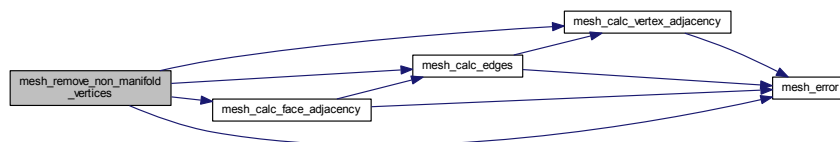
Parameters

in	<i>m</i>	Input mesh
----	----------	------------

Returns

Error code

Here is the call graph for this function:



5.7.4.42 MESHLIBAPI int mesh_remove_triangles_with_small_area (MESH *m*, FLOATDATA *area*)

Removes triangles with area smaller than a given value.

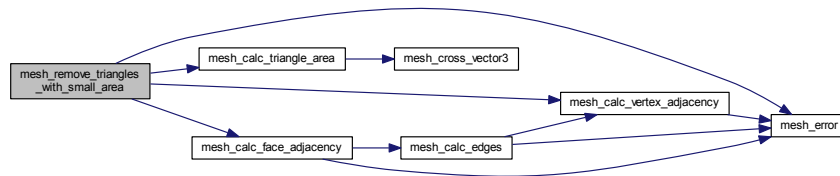
Parameters

in	<i>m</i>	Input mesh
in	<i>area</i>	Given area

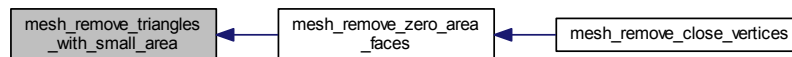
Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.43 MESHLIBAPI int mesh_remove_unreferenced_vertices (MESH *m*)

Removes unreferenced vertices.

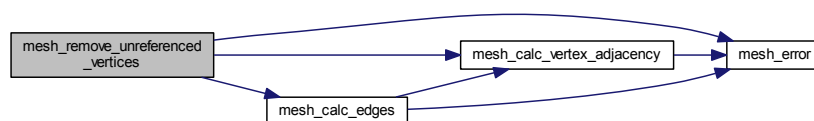
Parameters

in	<i>m</i>	Input mesh
----	----------	------------

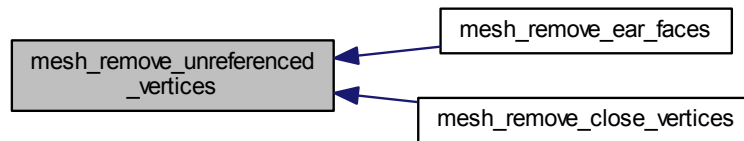
Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.44 MESHLIBAPI int mesh_remove_zero_area_faces (MESH *m*)

Removes triangles with zero area.

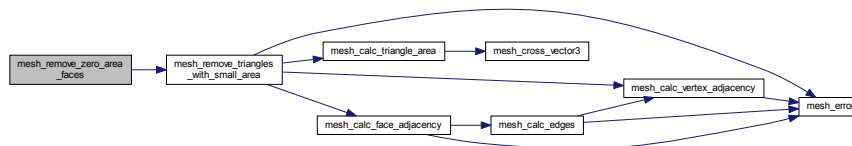
Parameters

in	<i>m</i>	Input mesh
----	----------	------------

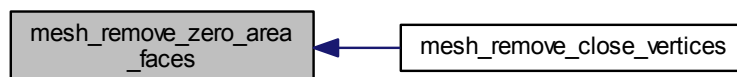
Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.45 MESHLIBAPI int mesh_restricted_laplacian_filter (MESH *m*, FLOATDATA *r*, FLOATDATA *ang*)

Restricted Mesh Laplacian filter.

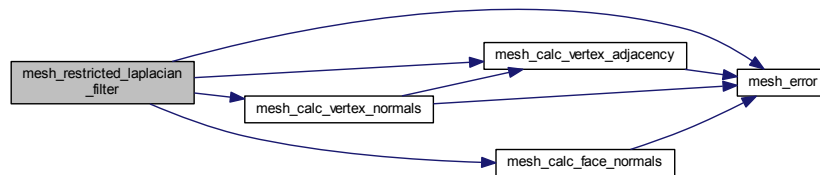
Parameters

in	<i>m</i>	Input mesh
in	<i>r</i>	Amount of diffusion
in	<i>ang</i>	Minimum angle in degrees to suppress filtering

Returns

Error code

Here is the call graph for this function:

5.7.4.46 MESHLIBAPI int mesh_rotate (MESH *m*, MESH_ROTATION *r*)

Rotates a mesh by a given rotation.

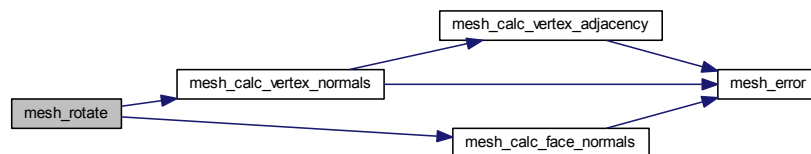
Parameters

in	<i>m</i>	Input vertex
in	<i>r</i>	Input rotation

Returns

Error code

Here is the call graph for this function:



5.7.4.47 MESHLIBAPI MESH_ROTATION mesh_rotation_create ()

Creates a new rotation.

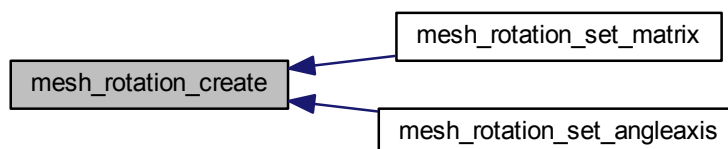
Returns

Output rotation

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.48 MESHLIBAPI void mesh_rotation_free (MESH_ROTATION *r*)

Frees a given rotation.

Parameters

<i>r</i>	Input rotation
----------	----------------

Returns

NULL

5.7.4.49 MESHLIBAPI MESH_ROTATION mesh_rotation_set_angleaxis (FLOATDATA *ang*, MESH_NORMAL *axis*, MESH_ROTATION *r*)

Sets rotation from angle axis.

Parameters

in	<i>ang</i>	Input angle of rotation
out	<i>axis</i>	Input axis of rotation

out	<i>r</i>	Input rotation
-----	----------	----------------

Returns

Output rotation

Here is the call graph for this function:



5.7.4.50 MESHAPI MESH_ROTATION mesh_rotation_set_matrix (FLOATDATA * *mat*, MESH_ROTATION *r*)

Sets rotation from a matrix.

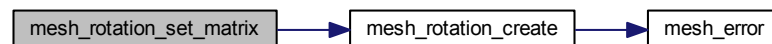
Parameters

in	<i>mat</i>	Input matrix
out	<i>r</i>	Input rotation

Returns

Output rotation

Here is the call graph for this function:



5.7.4.51 MESHAPI int mesh_scale (MESH *m*, FLOATDATA *sx*, FLOATDATA *sy*, FLOATDATA *sz*)

Scales a mesh by x, y and z amounts.

Parameters

in	<i>m</i>	Input mesh
in	<i>sx</i>	X component
in	<i>sy</i>	Y component
in	<i>sz</i>	Z component

Returns

Error code

5.7.4.52 **MESHLIBAPI** int mesh_skip_line (FILEPOINTER *fp*)

Skips to next line.

Parameters

<i>in</i>	<i>fp</i>	Pointer to input file
-----------	-----------	-----------------------

Returns

Status 0 - Normal/ 1- EOF

5.7.4.53 MESHLIBAPI int mesh_translate (MESH *m*, FLOATDATA *x*, FLOATDATA *y*, FLOATDATA *z*)

Translates a mesh by *x*, *y* and *z* amounts.

Parameters

<i>in</i>	<i>m</i>	Input mesh
<i>in</i>	<i>x</i>	X component
<i>in</i>	<i>y</i>	Y component
<i>in</i>	<i>z</i>	Z component

Returns

Error code

5.7.4.54 MESHLIBAPI int mesh_translate_vector (MESH *m*, MESH_VECTOR3 *v*)

Translates a mesh by a given 3-d vector.

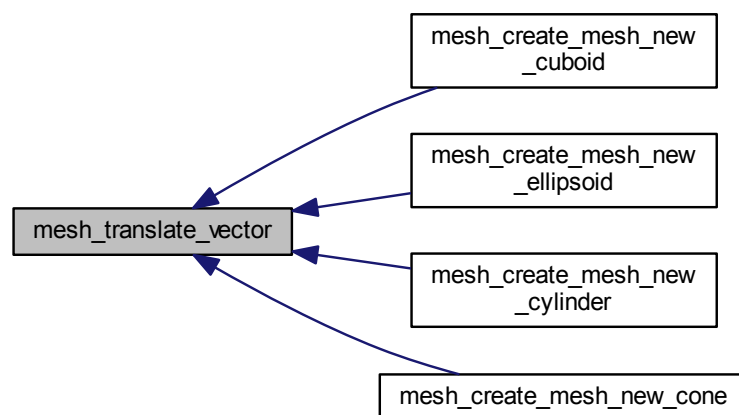
Parameters

<i>in</i>	<i>m</i>	Input mesh
<i>in</i>	<i>v</i>	Input vector

Returns

Error code

Here is the caller graph for this function:



5.7.4.55 MESHAPI int mesh_upsample (MESH *m*, int *iters*)

Upsamples a given mesh.

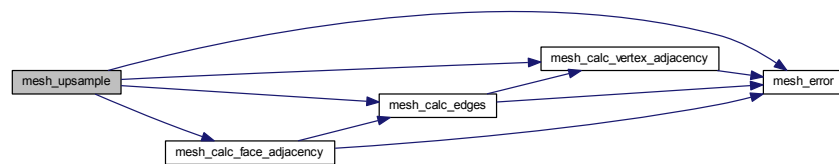
Parameters

in	<i>m</i>	Input mesh
in	<i>iters</i>	Number of iterations

Returns

Error code

Here is the call graph for this function:



5.7.4.56 MESHAPI MESH_VERTEX mesh_vertex_rotate (MESH_VERTEX *v*, MESH_ROTATION *r*)

Rotates a vertex by a given rotation.

Parameters

in	<i>v</i>	Input vertex
in	<i>r</i>	Input rotation

Returns

Output vertex

5.7.4.57 MESHAPI int mesh_write_file (MESH *m*, const char * *fname*)

Write a mesh to an OFF/PLY/ASC/XYZ file.

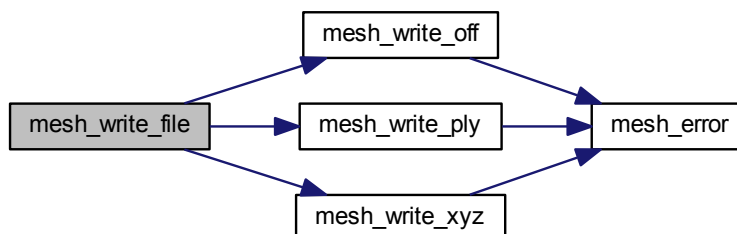
Parameters

in	<i>m</i>	Input mesh
in	<i>fname</i>	Output filename

Returns

Error code

Here is the call graph for this function:



5.7.4.58 MESHLIBAPI int mesh_write_off (MESH *m*, const char * *fname*)

Write a mesh to an OFF file.

Parameters

in	<i>m</i>	Input mesh
in	<i>fname</i>	Output filename

Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.59 MESHAPI int mesh_write_ply (MESH *m*, const char * *fname*)

Write a mesh to an PLY file.

Parameters

in	<i>m</i>	Input mesh
in	<i>fname</i>	Output filename

Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



5.7.4.60 MESHAPI int mesh_write_xyz (MESH *m*, const char * *fname*)

Write a mesh to an XYZ file.

Parameters

in	<i>m</i>	Input mesh
in	<i>fname</i>	Output filename

Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:

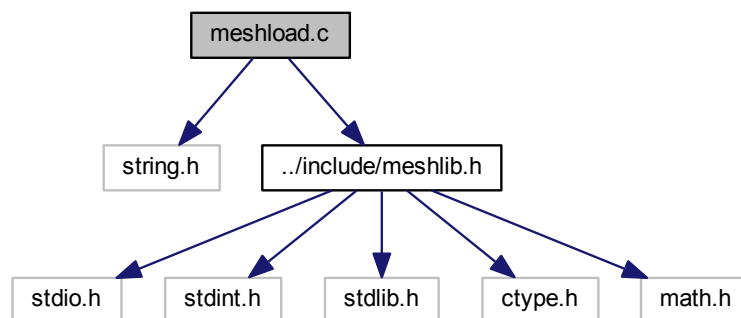


5.8 meshload.c File Reference

This file contains functions pertaining to loading different mesh file types.

```
#include <string.h>
#include "../include/meshlib.h"
```

Include dependency graph for meshload.c:



Functions

- [MESH mesh_load_file](#) (const char *fname)

- Reads a mesh from an OFF/PLY/ASC/XYZ file.*
 - **MESH mesh_load_off** (const char *fname)
Reads a mesh from an OFF file.
 - **MESH mesh_load_xyz** (const char *fname)
Read a mesh from an ASC/XYZ file.
 - **MESH mesh_load_ply** (const char *fname)
Reads a mesh from a PLY file.

5.8.1 Detailed Description

This file contains functions pertaining to loading different mesh file types.

Author

Sk. Mohammadul Haque

Version

1.4.2.0

Copyright

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5.8.2 Function Documentation

5.8.2.1 MESH mesh_load_file (const char * fname)

Reads a mesh from an OFF/PLY/ASC/XYZ file.

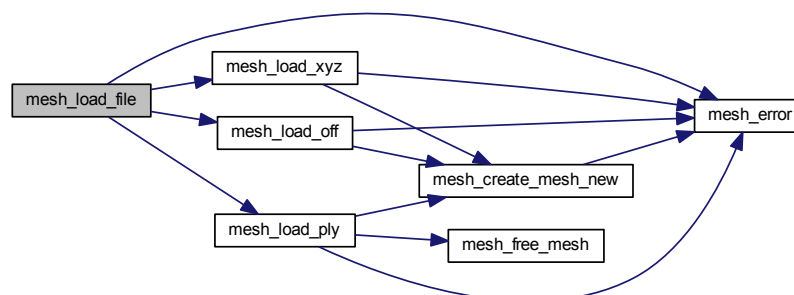
Parameters

in	fname	Input filename
----	-------	----------------

Returns

Output mesh

Here is the call graph for this function:



5.8.2.2 MESH mesh_load_off (const char * *fname*)

Reads a mesh from an OFF file.

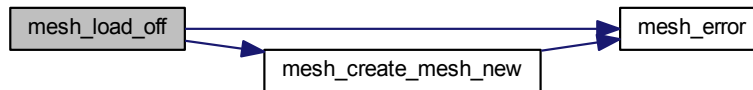
Parameters

<i>in</i>	<i>fname</i>	Input filename
-----------	--------------	----------------

Returns

Output mesh

Here is the call graph for this function:



Here is the caller graph for this function:



5.8.2.3 MESH mesh_load_ply (const char * *fname*)

Reads a mesh from a PLY file.

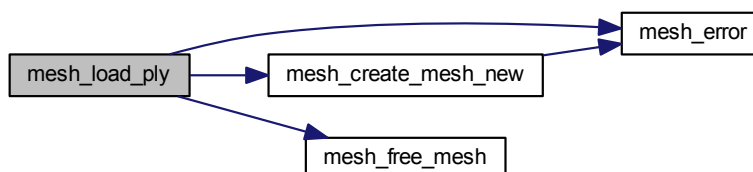
Parameters

<i>in</i>	<i>fname</i>	Input filename
-----------	--------------	----------------

Returns

Output mesh

Here is the call graph for this function:



Here is the caller graph for this function:



5.8.2.4 MESH mesh_load_xyz (const char * *fname*)

Read a mesh from an ASC/XYZ file.

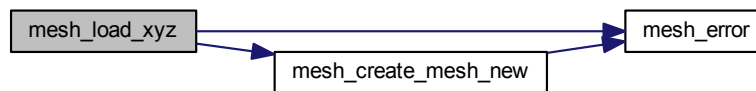
Parameters

<i>in</i>	<i>fname</i>	Input filename
-----------	--------------	----------------

Returns

Output mesh

Here is the call graph for this function:



Here is the caller graph for this function:



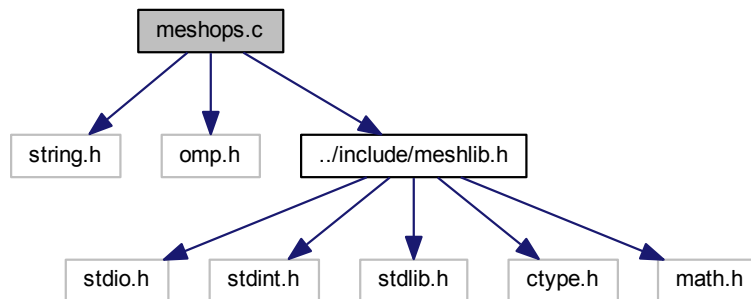
5.9 meshops.c File Reference

This file contains functions pertaining to mesh combinatorial operations.

```

#include <string.h>
#include <omp.h>
#include "../include/meshlib.h"
  
```

Include dependency graph for meshops.c:



Functions

- [MESH mesh_clone_mesh](#) ([MESH](#) m, [uint16_t](#) flags)
Clones a given mesh into another mesh.
- [MESH mesh_combine_mesh](#) ([MESH](#) m1, [MESH](#) m2)
Combines a given mesh with another given mesh.

5.9.1 Detailed Description

This file contains functions pertaining to mesh combinatorial operations.

Author

Sk. Mohammadul Haque

Version

1.4.2.0

Copyright

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5.9.2 Function Documentation

5.9.2.1 [MESH mesh_clone_mesh](#) ([MESH](#) m, [uint16_t](#) flags)

Clones a given mesh into another mesh.

Parameters

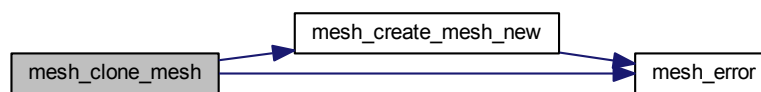
in	m	Input mesh to clone
----	---	---------------------

<i>in</i>	<i>flags</i>	Flags to copy which properties (MESH_CLONE_VERTICES/MESH_CLONE_VNORMALS/MESH_CLONE_VCOLORS/MESH_CLONE_VFACES/MESH_CLONE_V_ALL_PROPS/MESH_CLONE_FACES/MESH_CLONE_FNORMALS/MESH_CLONE_FCOLORS/MESH_CLONE_FAREAS/MESH_CLONE_F_ALL_PROPS/MESH_CLONE_ALL_PROPS)
-----------	--------------	--

Returns

Output cloned mesh

Here is the call graph for this function:



Here is the caller graph for this function:



5.9.2.2 MESH mesh_combine_mesh (MESH *m1*, MESH *m2*)

Combines a given mesh with another given mesh.

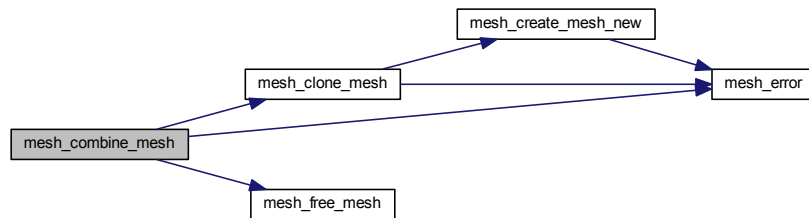
Parameters

<i>in</i>	<i>m1</i>	Input mesh to combine with
<i>in</i>	<i>m2</i>	Input mesh to combine

Returns

Output combined mesh

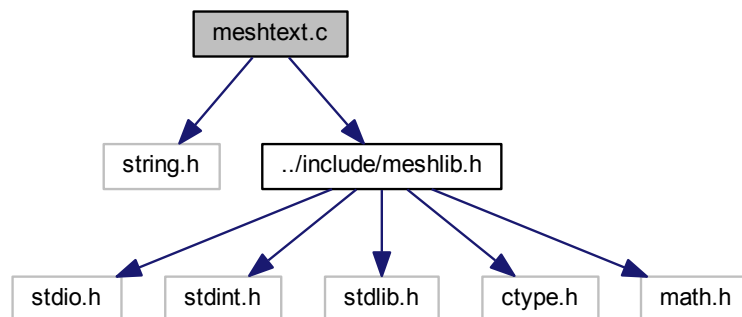
Here is the call graph for this function:



5.10 meshtext.c File Reference

This file contains functions pertaining to different text routines.

```
#include <string.h>
#include "../include/meshlib.h"
Include dependency graph for meshtext.c:
```

**Functions**

- int `mesh_isnumeric` (FILEPOINTER fp)
Checks if numeric or not.
- int `mesh_go_next_word` (FILEPOINTER fp)
Points to the next word.
- int `mesh_count_words_in_line` (FILEPOINTER fp, int *count)
Counts number of words in the current line.
- int `mesh_read_word` (FILEPOINTER fp, char *c_word, int sz)
Reads current word and moves to the next word.
- int `mesh_read_word_only` (FILEPOINTER fp, char *c_word, int sz)

Reads current word without moving to the next word.

- int `mesh_skip_line` (FILEPOINTER `fp`)

Skips to next line.

5.10.1 Detailed Description

This file contains functions pertaining to different text routines.

Author

Sk. Mohammadul Haque

Version

1.4.2.0

Copyright

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5.10.2 Function Documentation

5.10.2.1 int `mesh_count_words_in_line` (FILEPOINTER `fp`, int * `count`)

Counts number of words in the current line.

Parameters

in	<i>fp</i>	Pointer to input file
out	<i>count</i>	Count

Returns

Status 0 - Normal/ 1- EOF

5.10.2.2 int `mesh_go_next_word` (FILEPOINTER `fp`)

Points to the next word.

Parameters

in	<i>fp</i>	Pointer to input file
----	-----------	-----------------------

Returns

Status 0 - Normal/ 1- EOF

5.10.2.3 int `mesh_isnumeric` (FILEPOINTER `fp`)

Checks if numeric or not.

Parameters

<i>in</i>	<i>fp</i>	Pointer to input file
-----------	-----------	-----------------------

Returns

1 for numeric/ else - for non-numeric

5.10.2.4 int mesh_read_word (FILEPOINTER *fp*, char * *c_word*, int *sz*)

Reads current word and moves to the next word.

Parameters

<i>in</i>	<i>fp</i>	Pointer to input file
<i>out</i>	<i>c_word</i>	Variable to store the word
<i>in</i>	<i>sz</i>	Maximum size to read

Returns

Status 0 - Normal/ 1- EOF

5.10.2.5 int mesh_read_word_only (FILEPOINTER *fp*, char * *c_word*, int *sz*)

Reads current word without moving to the next word.

Parameters

<i>in</i>	<i>fp</i>	Pointer to input file
<i>out</i>	<i>c_word</i>	Variable to store the word
<i>in</i>	<i>sz</i>	Maximum size to read

Returns

Status 0 - Normal/ 1- EOF

5.10.2.6 int mesh_skip_line (FILEPOINTER *fp*)

Skips to next line.

Parameters

<i>in</i>	<i>fp</i>	Pointer to input file
-----------	-----------	-----------------------

Returns

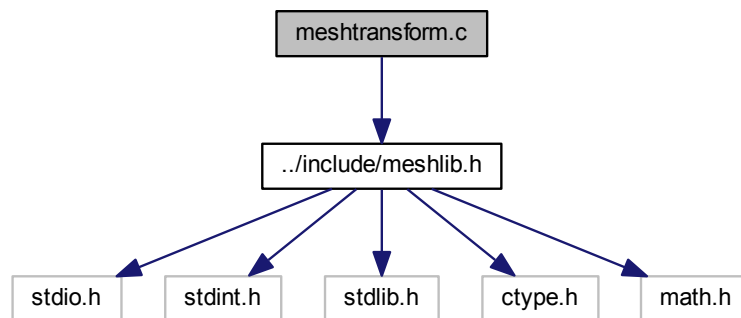
Status 0 - Normal/ 1- EOF

5.11 meshtransform.c File Reference

This file contains functions pertaining to different mesh transformations.

```
#include "../include/meshlib.h"
```

Include dependency graph for meshtransform.c:



Functions

- [MESH_ROTATION mesh_rotation_create](#) ()
Creates a new rotation.
- void [mesh_rotation_free](#) ([MESH_ROTATION](#) r)
Frees a given rotation.
- [MESH_ROTATION mesh_rotation_set_matrix](#) ([FLOATDATA](#) *mat, [MESH_ROTATION](#) r)
Sets rotation from a matrix.
- [MESH_ROTATION mesh_rotation_set_angleaxis](#) ([FLOATDATA](#) ang, [MESH_NORMAL](#) axis, [MESH_ROTATION](#) r)
Sets rotation from angle axis.
- int [mesh_translate](#) ([MESH](#) m, [FLOATDATA](#) x, [FLOATDATA](#) y, [FLOATDATA](#) z)
Translates a mesh by x, y and z amounts.
- int [mesh_translate_vector](#) ([MESH](#) m, [MESH_VECTOR3](#) v)
Translates a mesh by a given 3-d vector.
- int [mesh_scale](#) ([MESH](#) m, [FLOATDATA](#) sx, [FLOATDATA](#) sy, [FLOATDATA](#) sz)
Scales a mesh by x, y and z amounts.
- [MESH_VERTEX mesh_vertex_rotate](#) ([MESH_VERTEX](#) v, [MESH_ROTATION](#) r)
Rotates a vertex by a given rotation.
- int [mesh_rotate](#) ([MESH](#) m, [MESH_ROTATION](#) r)
Rotates a mesh by a given rotation.

5.11.1 Detailed Description

This file contains functions pertaining to different mesh transformations.

Author

Sk. Mohammadul Haque

Version

1.4.2.0

Copyright

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5.11.2 Function Documentation

5.11.2.1 `int mesh_rotate (MESH m, MESH_ROTATION r)`

Rotates a mesh by a given rotation.

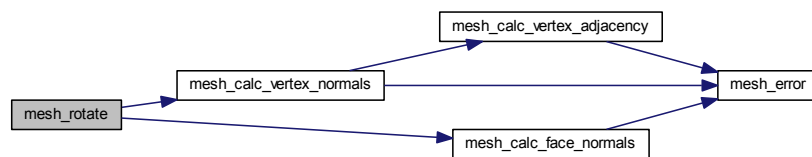
Parameters

<code>in</code>	<code><i>m</i></code>	Input vertex
<code>in</code>	<code><i>r</i></code>	Input rotation

Returns

Error code

Here is the call graph for this function:

5.11.2.2 `MESH_ROTATION mesh_rotation_create ()`

Creates a new rotation.

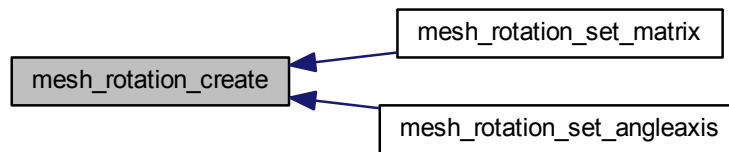
Returns

Output rotation

Here is the call graph for this function:



Here is the caller graph for this function:



5.11.2.3 void mesh_rotation_free (MESH_ROTATION *r*)

Frees a given rotation.

Parameters

<i>r</i>	Input rotation
----------	----------------

Returns

NULL

5.11.2.4 MESH_ROTATION mesh_rotation_set_angleaxis (FLOATDATA *ang*, MESH_NORMAL *axis*, MESH_ROTATION *r*)

Sets rotation from angle axis.

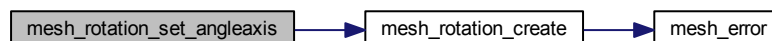
Parameters

in	<i>ang</i>	Input angle of rotation
out	<i>axis</i>	Input axis of rotation
out	<i>r</i>	Input rotation

Returns

Output rotation

Here is the call graph for this function:



5.11.2.5 MESH_ROTATION mesh_rotation_set_matrix (FLOATDATA **mat*, MESH_ROTATION *r*)

Sets rotation from a matrix.

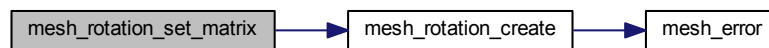
Parameters

in	<i>mat</i>	Input matrix
out	<i>r</i>	Input rotation

Returns

Output rotation

Here is the call graph for this function:



5.11.2.6 int mesh_scale (MESH *m*, FLOATDATA *sx*, FLOATDATA *sy*, FLOATDATA *sz*)

Scales a mesh by x, y and z amounts.

Parameters

in	<i>m</i>	Input mesh
in	<i>sx</i>	X component
in	<i>sy</i>	Y component
in	<i>sz</i>	Z component

Returns

Error code

5.11.2.7 int mesh_translate (MESH *m*, FLOATDATA *x*, FLOATDATA *y*, FLOATDATA *z*)

Translates a mesh by x, y and z amounts.

Parameters

in	<i>m</i>	Input mesh
in	<i>x</i>	X component
in	<i>y</i>	Y component
in	<i>z</i>	Z component

Returns

Error code

5.11.2.8 int mesh_translate_vector (MESH *m*, MESH_VECTOR3 *v*)

Translates a mesh by a given 3-d vector.

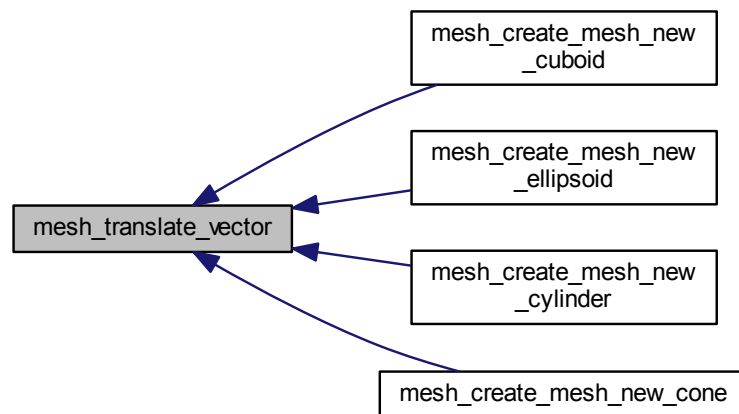
Parameters

in	<i>m</i>	Input mesh
in	<i>v</i>	Input vector

Returns

Error code

Here is the caller graph for this function:



5.11.2.9 MESH_VERTEX mesh_vertex_rotate (MESH_VERTEX *v*, MESH_ROTATION *r*)

Rotates a vertex by a given rotation.

Parameters

in	<i>v</i>	Input vertex
in	<i>r</i>	Input rotation

Returns

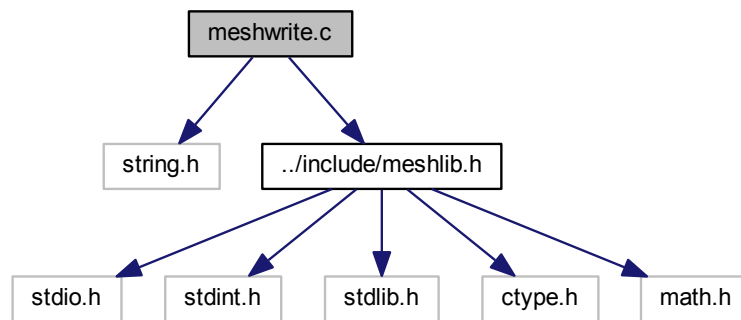
Output vertex

5.12 meshwrite.c File Reference

This file contains functions pertaining to writing different mesh file types.

```
#include <string.h>
#include "../include/meshlib.h"
```

Include dependency graph for meshwrite.c:



Functions

- int [mesh_write_file](#) (MESH m, const char *fname)
Write a mesh to an OFF/PLY/ASC/XYZ file.
- int [mesh_write_off](#) (MESH m, const char *fname)
Write a mesh to an OFF file.
- int [mesh_write_xyz](#) (MESH m, const char *fname)
Write a mesh to an XYZ file.
- int [mesh_write_ply](#) (MESH m, const char *fname)
Write a mesh to an PLY file.

5.12.1 Detailed Description

This file contains functions pertaining to writing different mesh file types.

Author

Sk. Mohammadul Haque

Version

1.4.2.0

Copyright

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5.12.2 Function Documentation

5.12.2.1 int mesh_write_file (MESH m, const char * fname)

Write a mesh to an OFF/PLY/ASC/XYZ file.

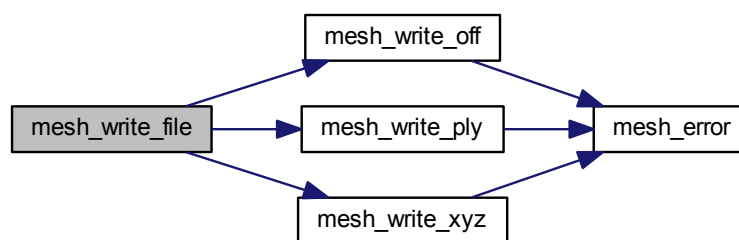
Parameters

in	<i>m</i>	Input mesh
in	<i>fname</i>	Output filename

Returns

Error code

Here is the call graph for this function:



5.12.2.2 int mesh_write_off (MESH *m*, const char * *fname*)

Write a mesh to an OFF file.

Parameters

in	<i>m</i>	Input mesh
in	<i>fname</i>	Output filename

Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



5.12.2.3 int mesh_write_ply (MESH *m*, const char * *fname*)

Write a mesh to an PLY file.

Parameters

in	<i>m</i>	Input mesh
in	<i>fname</i>	Output filename

Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



5.12.2.4 int mesh_write_xyz (MESH *m*, const char * *fname*)

Write a mesh to an XYZ file.

Parameters

<i>in</i>	<i>m</i>	Input mesh
<i>in</i>	<i>fname</i>	Output filename

Returns

Error code

Here is the call graph for this function:



Here is the caller graph for this function:



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