Arcade

Generated by Doxygen 1.9.1

Chapter 1

Namespace Index

1.1 Namespace List

Here is a list of all namespaces with brief descriptions:

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

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

Chapter 3

Data Structure Index

3.1 Data Structures

Here are the data structures with brief descriptions:

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

Chapter 5

Namespace Documentation

5.1 Math Namespace Reference

Namespace for the math functions.

Data Structures

- class Point3D

  Class for the 3D point.
- class Rectangle3D

  Class for the 3D rectangle.
- class Vector3D

Functions

- std::ostream & operator<< (std::ostream &os, const Point3D &vect)

  Outputs a human-readable representation of the given point to the given output stream.
- std::ostream & operator<< (std::ostream &os, const Vector3D &vect)

  Calculates the cross product of two vectors.

5.1.1 Detailed Description

Namespace for the math functions.

Namespace for the math library.

5.1.2 Function Documentation

5.1.2.1 operator<<() [1/2]

```
std::ostream & Math::operator<< (
             std::ostream & os,
             const Point3D & vect )
```

Outputs a human-readable representation of the given point to the given output stream.

Parameters

os	The output stream to write to.
vect	The point to output.

Returns

The output stream after writing the point.

5.1.2.2 operator<<() [2/2]

```
std::ostream & Math::operator<< (
            std::ostream & os,
            const Vector3D & vect )
```

Calculates the cross product of two vectors.

Parameters

vector1	The first vector.
vector2	The second vector.

Returns

The cross product of the two vectors as a new vector.

5.2 RayTracer Namespace Reference

Namespace for the raytracer.

Data Structures

- class Camera
- class Core
- class IEncoder
- class ALight
- class ILight
- class Color
- class Material

  Material class representing the properties of a surface of an object.
- class Ray

  Class for the ray.
- class IParser
- class Parser

  Class for the parser.

- class APrimitives
- class IPrimitives
- struct intersection

  Struct for the intersection.
- class IRenderer
- class Scene

  Class for the scene.
- struct imageSize
- class Encoder

  Encoder class.
- class SfmlEncoder
- class AmbientLight
- class DirectionalLight
- class PointLight
- class Cone
- class Cylinder
- class Plan
- class Sphere
- class Renderer
- class FastRenderer
- class LiveRenderer

5.2.1 Detailed Description

Namespace for the raytracer.

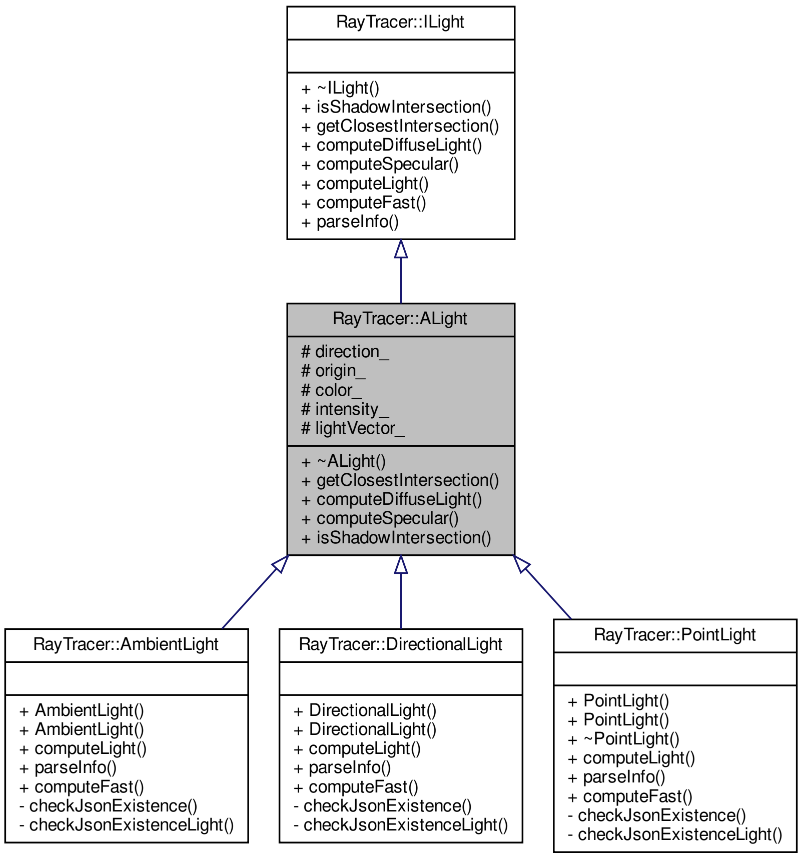
Chapter 6

Data Structure Documentation

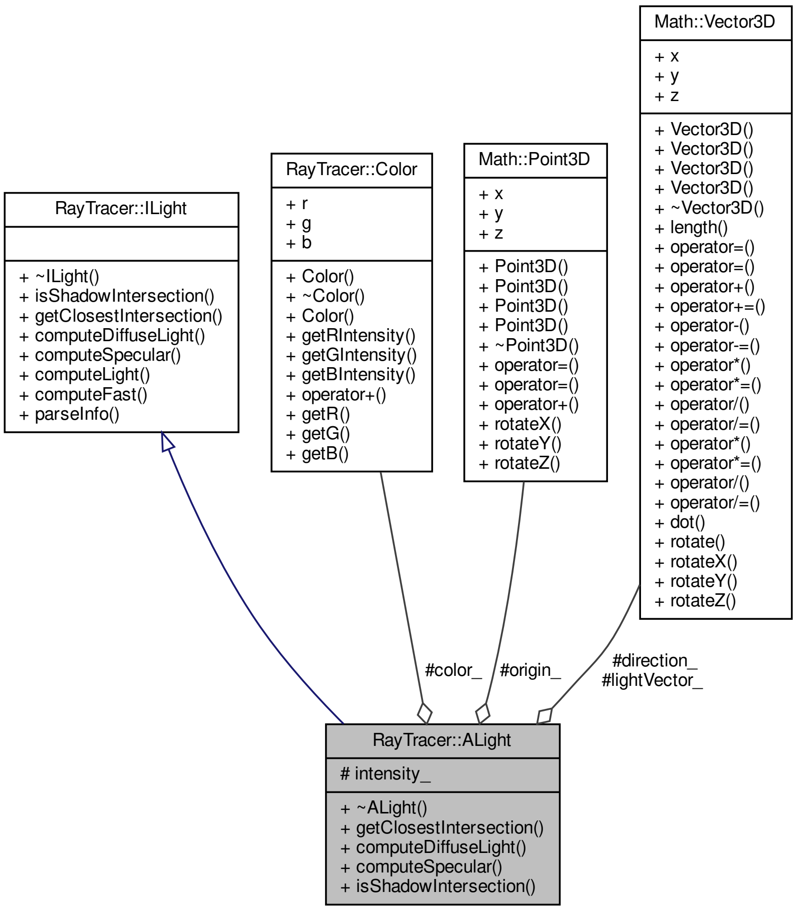
6.1 RayTracer::ALight Class Reference

```
#include <ALight.hpp>
```

Inheritance diagram for RayTracer::ALight:



Collaboration diagram for RayTracer::ALight:



Public Member Functions

- ∼ALight () override=default
- intersection getClosestIntersection (RayTracer::Ray ray, double tMin, double tMax, std::vector< std::unique↩ _ptr< IPrimitives >> &primitives) final
- Color computeDiffuseLight (Math::Vector3D normalVector) final
- Color computeSpecular (Math::Vector3D normalVector, int spec, Math::Vector3D rayDir) final
- bool isShadowIntersection (Math::Point3D intersectionPoint, std::vector< std::unique_ptr< IPrimitives >> &primitives) final

Protected Attributes

- Math::Vector3D direction_ {0, 0, 0}
- Math::Point3D origin_ {0, 0, 0}
- Color color_ {0, 0, 0}
- double intensity_ {0.0}
- Math::Vector3D lightVector_ {0, 0, 0}

6.1.1 Constructor & Destructor Documentation

6.1.1.1 ∼ALight()

```
RayTracer::ALight::∼ALight ( )  [override], [default]
```

6.1.2 Member Function Documentation

6.1.2.1 computeDiffuseLight()

```
Color RayTracer::ALight::computeDiffuseLight (
            Math::Vector3D normalVector )  [final], [virtual]
```

Implements RayTracer::ILight.

6.1.2.2 computeSpecular()

```
Color RayTracer::ALight::computeSpecular (
            Math::Vector3D normalVector,
            int spec,
            Math::Vector3D rayDir )  [final], [virtual]
```

Implements RayTracer::ILight.

6.1.2.3 getClosestIntersection()

```
intersection RayTracer::ALight::getClosestIntersection (
            RayTracer::Ray ray,
            double tMin,
            double tMax,
            std::vector< std::unique_ptr< IPrimitives >> & primitives )  [final], [virtual]
```

Implements RayTracer::ILight.

6.1.2.4 isShadowIntersection()

```
bool RayTracer::ALight::isShadowIntersection (
            Math::Point3D intersectionPoint,
            std::vector< std::unique_ptr< IPrimitives >> & primitives )  [final], [virtual]
```

Implements RayTracer::ILight.

6.1.3 Field Documentation

6.1.3.1 color_

```
Color RayTracer::ALight::color_ {0, 0, 0}  [protected]
```

6.1.3.2 direction_

```
Math::Vector3D RayTracer::ALight::direction_ {0, 0, 0}  [protected]
```

6.1.3.3 intensity_

```
double RayTracer::ALight::intensity_ {0.0}  [protected]
```

6.1.3.4 lightVector_

```
Math::Vector3D RayTracer::ALight::lightVector_ {0, 0, 0}  [protected]
```

6.1.3.5 origin_

```
Math::Point3D RayTracer::ALight::origin_ {0, 0, 0}  [protected]
```

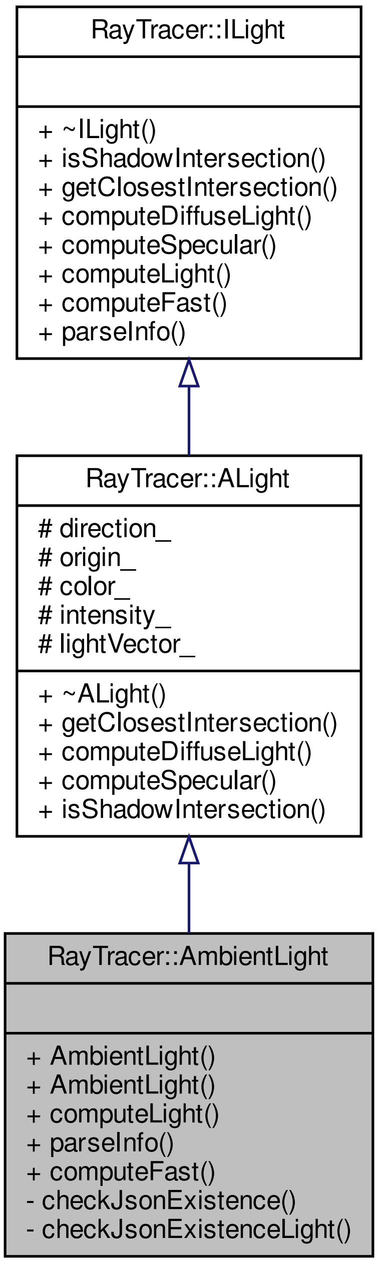
The documentation for this class was generated from the following files:

- include/lights/ALight.hpp
- src/lights/ALight.cpp

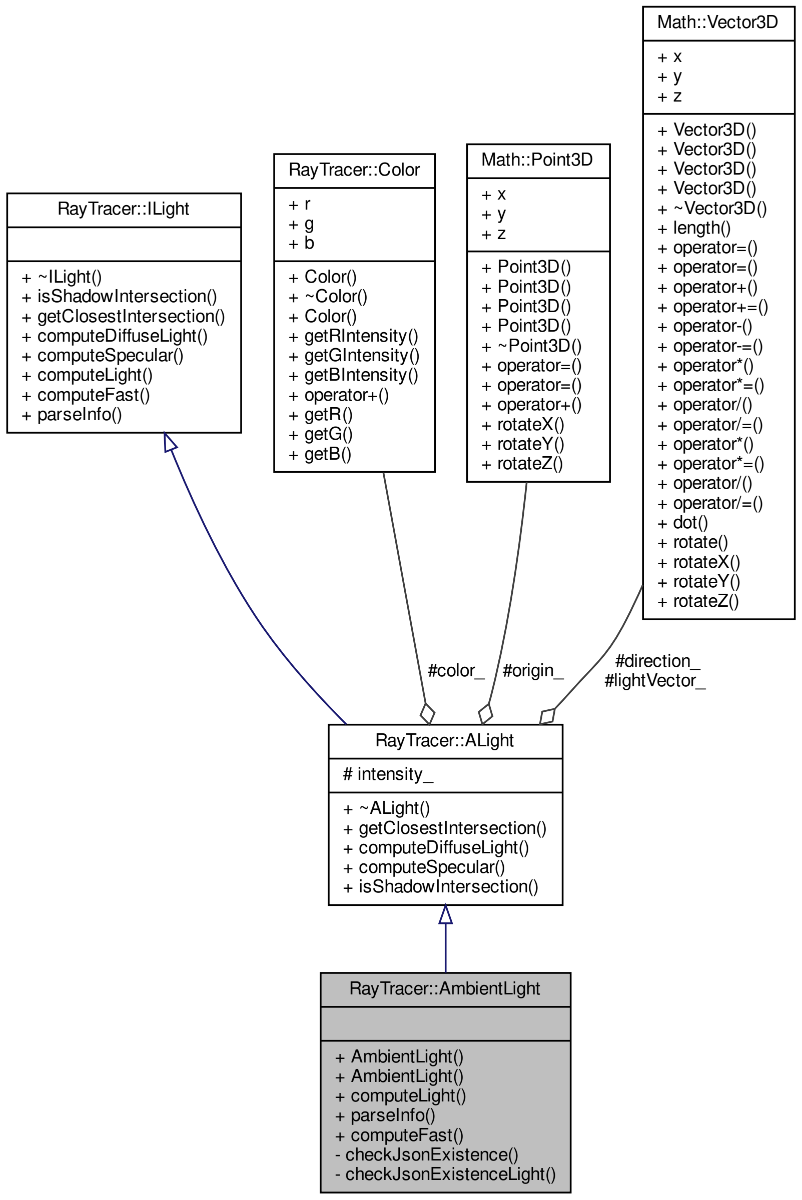
6.2 RayTracer::AmbientLight Class Reference

```
#include <AmbientLight.hpp>
```

Inheritance diagram for RayTracer::AmbientLight:



Collaboration diagram for RayTracer::AmbientLight:



Public Member Functions

- AmbientLight ()=default
- AmbientLight (Color color, double intensity)
- Color computeLight (Math::Vector3D normalVector, int spec, Math::Point3D intersectionPoint, Math::Vector3D rayDir, std::vector< std::unique_ptr< IPrimitives >> &primitives) final
- void parseInfo (json object) final

  Information parser to create the light object.
- Color computeFast (Math::Vector3D normalVector, int spec, Math::Point3D intersectionPoint, Math::Vector3D rayDir, std::vector< std::unique_ptr< IPrimitives >> &primitives) final

Private Member Functions

- void checkJsonExistence (const json &scene, const std::string &field_name)
- void checkJsonExistenceLight (const json &scene)

Additional Inherited Members

6.2.1 Constructor & Destructor Documentation

6.2.1.1 AmbientLight() [1/2]

```
RayTracer::AmbientLight::AmbientLight ( )  [default]
```

6.2.1.2 AmbientLight() [2/2]

```
RayTracer::AmbientLight::AmbientLight (
            Color color,
            double intensity )  [explicit]
```

6.2.2 Member Function Documentation

6.2.2.1 checkJsonExistence()

```
void RayTracer::AmbientLight::checkJsonExistence (
            const json & scene,
            const std::string & field_name )  [private]
```

6.2.2.2 checkJsonExistenceLight()

```
void RayTracer::AmbientLight::checkJsonExistenceLight (
            const json & scene )  [private]
```

6.2.2.3 computeFast()

```
Color RayTracer::AmbientLight::computeFast (
             Math::Vector3D normalVector,
             int spec,
             Math::Point3D intersectionPoint,
             Math::Vector3D rayDir,
             std::vector< std::unique_ptr< IPrimitives >> & primitives )  [final], [virtual]
```

Implements RayTracer::ILight.

6.2.2.4 computeLight()

```
Color RayTracer::AmbientLight::computeLight (
             Math::Vector3D normalVector,
             int spec,
             Math::Point3D intersectionPoint,
             Math::Vector3D rayDir,
             std::vector< std::unique_ptr< IPrimitives >> & primitives )  [final], [virtual]
```

Implements RayTracer::ILight.

6.2.2.5 parseInfo()

```
void RayTracer::AmbientLight::parseInfo (
             json object )  [final], [virtual]
```

Information parser to create the light object.

Parameters

object	the json object containing light info

Implements RayTracer::ILight.

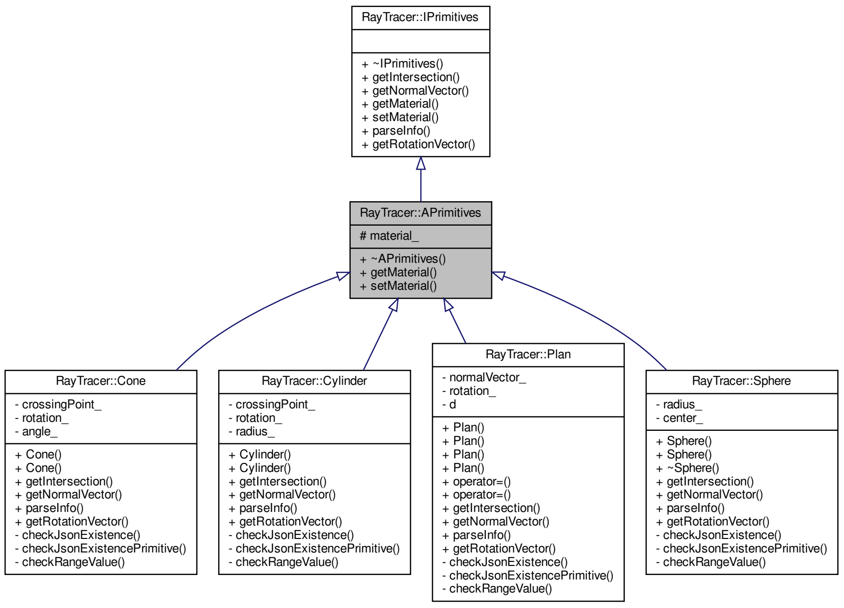
The documentation for this class was generated from the following files:

- src/plugins/lights/ambient/AmbientLight.hpp
- src/plugins/lights/ambient/AmbientLight.cpp

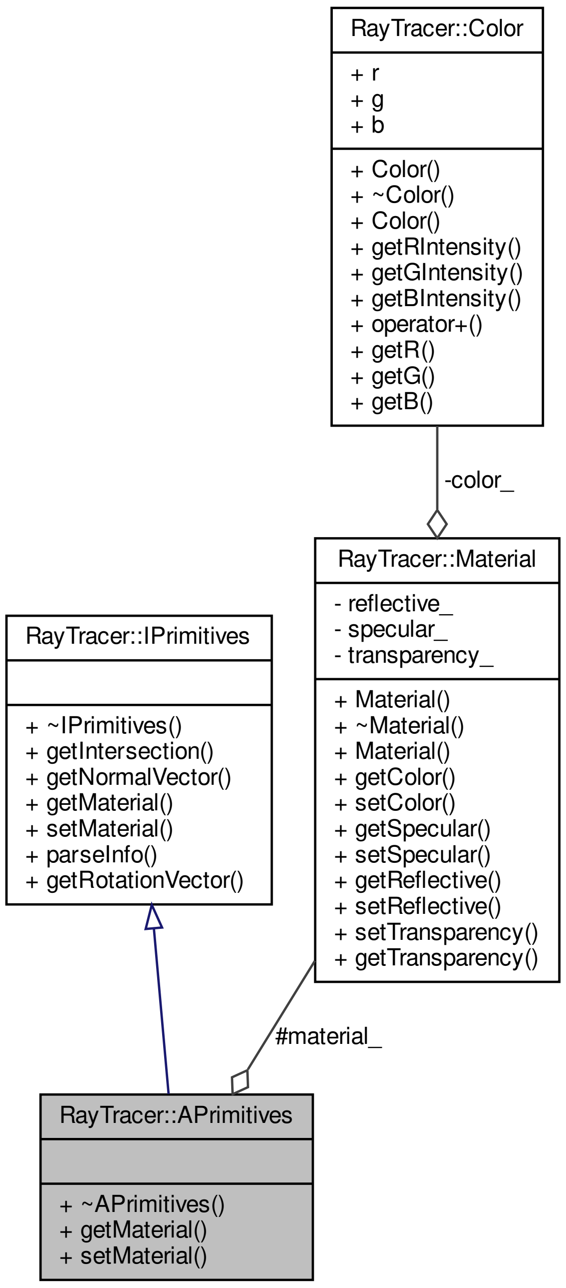
6.3 RayTracer::APrimitives Class Reference

```
#include <APrimitives.hpp>
```

Inheritance diagram for RayTracer::APrimitives:



Collaboration diagram for RayTracer::APrimitives:



Public Member Functions

- ∼APrimitives () override=default
- Material getMaterial () final
- void setMaterial (Color color, double reflect, int specular, double transparency) final

Protected Attributes

- Material material_

6.3.1 Constructor & Destructor Documentation

6.3.1.1 ∼APrimitives()

```
RayTracer::APrimitives::∼APrimitives ( )  [override], [default]
```

6.3.2 Member Function Documentation

6.3.2.1 getMaterial()

```
RayTracer::Material RayTracer::APrimitives::getMaterial ( )  [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.3.2.2 setMaterial()

```
void RayTracer::APrimitives::setMaterial (
             RayTracer::Color color,
             double reflect,
             int specular,
             double transparency )  [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.3.3 Field Documentation

6.3.3.1 material_

```
Material RayTracer::APrimitives::material_  [protected]
```

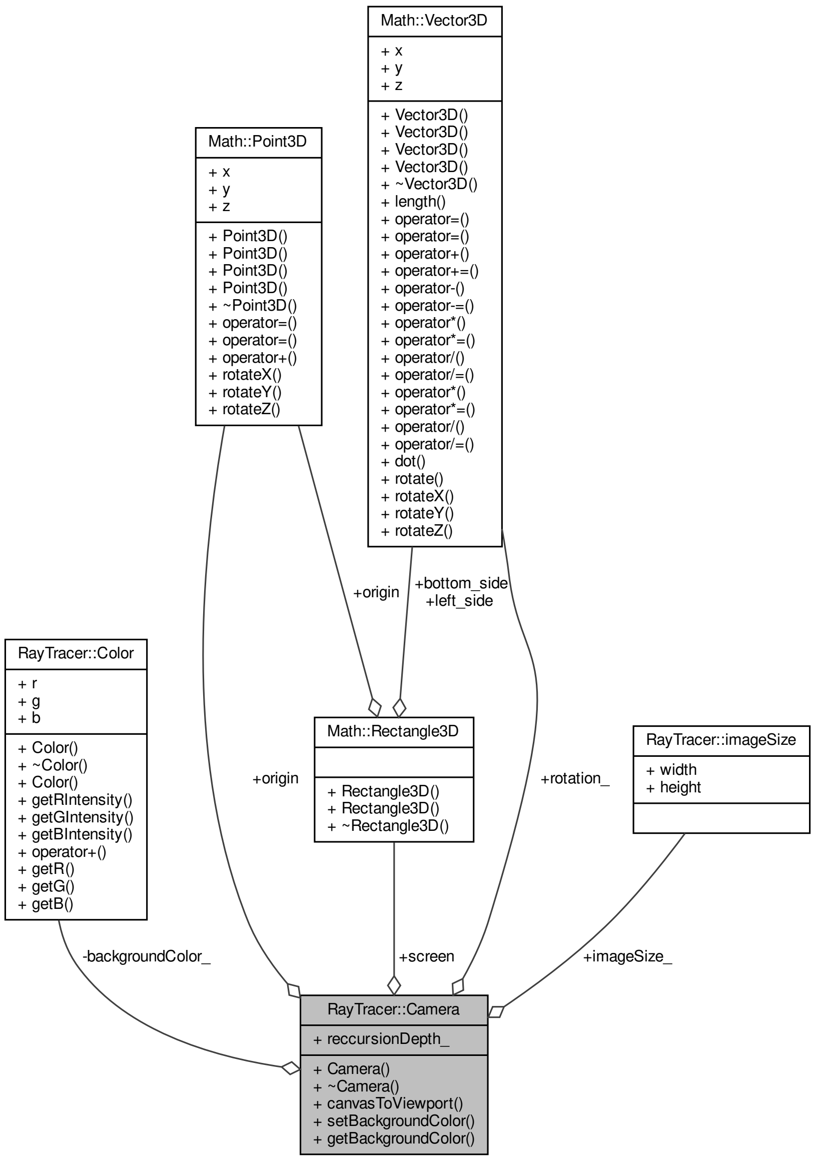
The documentation for this class was generated from the following files:

- include/primitives/APrimitives.hpp
- src/utils/Primitives.cpp

6.4 RayTracer::Camera Class Reference

```
#include <Camera.hpp>
```

Collaboration diagram for RayTracer::Camera:



Public Member Functions

- Camera ()=default
- ~Camera ()=default
- Math::Vector3D canvasToViewport (double u, double v)

  Converts canvas coordinates to viewport coordinates.
- void setBackgroundColor (Color color)

  Sets the background color of the scene.
- Color getBackgroundColor () const

  Returns the background color of the scene.

Data Fields

- Math::Point3D origin { 0, 0, 0 }
- Math::Rectangle3D screen
- Math::Vector3D rotation_
- imageSize imageSize_ { 400, 400 }
- int reccursionDepth_ { 1 }

Private Attributes

- Color backgroundColor_

6.4.1 Constructor & Destructor Documentation

6.4.1.1 Camera()

```
RayTracer::Camera::Camera ( )  [default]
```

6.4.1.2 ∼Camera()

```
RayTracer::Camera::∼Camera ( )  [default]
```

6.4.2 Member Function Documentation

6.4.2.1 canvasToViewport()

```
Math::Vector3D RayTracer::Camera::canvasToViewport (
            double u,
            double v )
```

Converts canvas coordinates to viewport coordinates.

Parameters

u	The x coordinate of the canvas.
v	The y coordinate of the canvas.

Returns

A Vector3D representing the converted viewport coordinates.

6.4.2.2 getBackgroundColor()

```
Color RayTracer::Camera::getBackgroundColor ( ) const
```

Returns the background color of the scene.

Returns

The background color of the scene.

6.4.2.3 setBackgroundColor()

```
void RayTracer::Camera::setBackgroundColor (
             Color color )
```

Sets the background color of the scene.

Parameters

color	The new background color to set.

6.4.3 Field Documentation

6.4.3.1 backgroundColor_

```
Color RayTracer::Camera::backgroundColor_  [private]
```

6.4.3.2 imageSize_

```
imageSize RayTracer::Camera::imageSize_ { 400, 400 }
```

6.4.3.3 origin

```
Math::Point3D RayTracer::Camera::origin { 0, 0, 0 }
```

6.4.3.4 reccursionDepth_

```
int RayTracer::Camera::reccursionDepth_ { 1 }
```

6.4.3.5 rotation_

```
Math::Vector3D RayTracer::Camera::rotation_
```

6.4.3.6 screen

```
Math::Rectangle3D RayTracer::Camera::screen
```

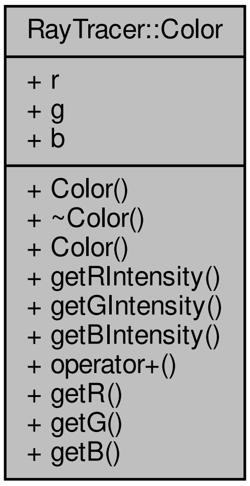
The documentation for this class was generated from the following files:

- include/Camera.hpp
- src/utils/Camera.cpp

6.5 RayTracer::Color Class Reference

```
#include <Color.hpp>
```

Collaboration diagram for RayTracer::Color:



Public Member Functions

- Color ()=default
- ∼Color ()=default
- Color (double r, double g, double b)

  Constructs a Color object with the given RGB values.
- double getRIntensity () const

  Returns the intensity of the red component of the color.
- double getGIntensity () const

  Returns the intensity of the green component of the color.
- double getBIntensity () const

  Returns the intensity of the blue component of the color.
- Color operator+ (const Color &)

  Adds the given color to this color.
- double getR () const
- double getG () const
- double getB () const

Data Fields

- double r
- double g
- double b

6.5.1 Constructor & Destructor Documentation

6.5.1.1 Color() [1/2]

```
RayTracer::Color::Color ( )  [default]
```

6.5.1.2 ∼Color()

```
RayTracer::Color::∼Color ( )  [default]
```

6.5.1.3 Color() [2/2]

```
RayTracer::Color::Color (
              double r,
              double g,
              double b )
```

Constructs a Color object with the given RGB values.

Parameters

r	The red component of the color.
g	The green component of the color.
b	The blue component of the color.

6.5.2 Member Function Documentation

6.5.2.1 getB()

```
double RayTracer::Color::getB ( ) const
```

6.5.2.2 getBIntensity()

```
double RayTracer::Color::getBIntensity ( ) const
```

Returns the intensity of the blue component of the color.

Returns

A double representing the intensity of the blue component.

6.5.2.3 getG()

```
double RayTracer::Color::getG ( ) const
```

6.5.2.4 getGIntensity()

```
double RayTracer::Color::getGIntensity ( ) const
```

Returns the intensity of the green component of the color.

Returns

A double representing the intensity of the green component.

6.5.2.5 getR()

```
double RayTracer::Color::getR ( ) const
```

6.5.2.6 getRIntensity()

```
double RayTracer::Color::getRIntensity ( ) const
```

Returns the intensity of the red component of the color.

Returns

A double representing the intensity of the red component.

6.5.2.7 operator+()

```
Color RayTracer::Color::operator+ (
             const Color & color )
```

Adds the given color to this color.

Parameters

color	The color to be added.

Returns

A Color object representing the sum of the two colors.

6.5.3 Field Documentation

6.5.3.1 b

```
double RayTracer::Color::b
```

6.5.3.2 g

```
double RayTracer::Color::g
```

6.5.3.3 r

```
double RayTracer::Color::r
```

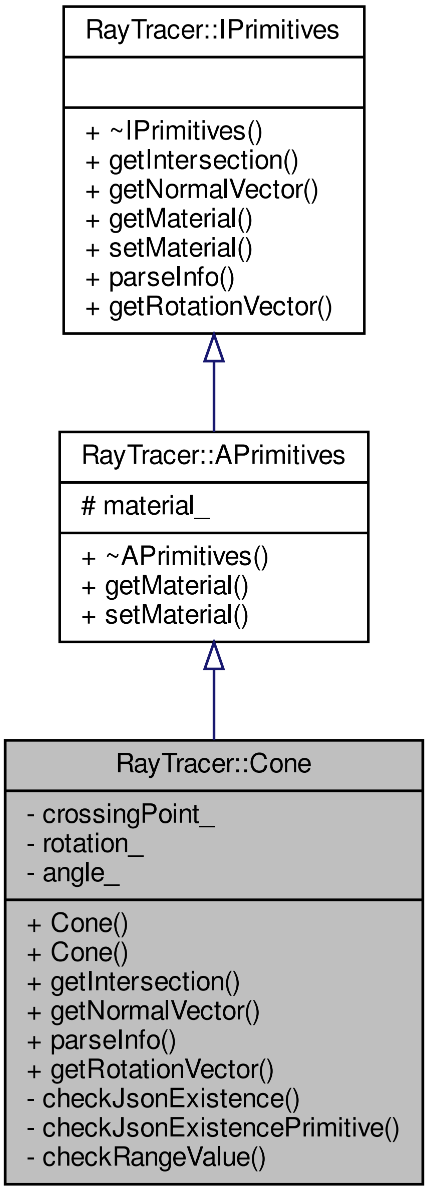
The documentation for this class was generated from the following files:

- include/material/Color.hpp
- src/utils/Color.cpp

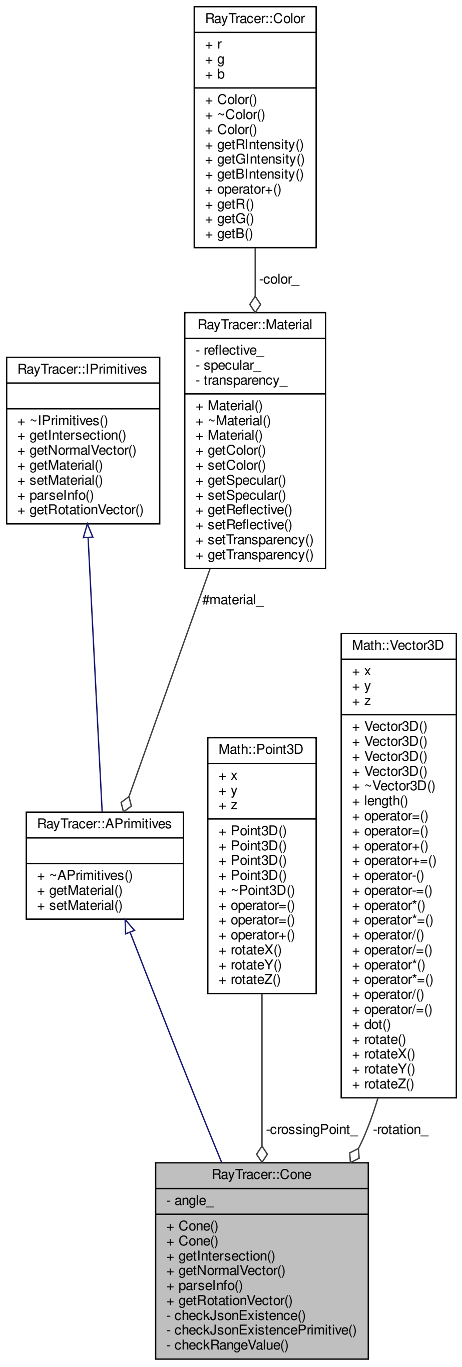
6.6 RayTracer::Cone Class Reference

```
#include <Cone.hpp>
```

Inheritance diagram for RayTracer::Cone:



Collaboration diagram for RayTracer::Cone:



Public Member Functions

- Cone (Math::Point3D crossingPoint, double angle)
- Cone ()=default
- std::vector< double > getIntersection (RayTracer::Ray) final
- Math::Vector3D getNormalVector (Math::Point3D point) final
- void parseInfo (json object) final
- Math::Vector3D getRotationVector ()

Private Member Functions

- void checkJsonExistence (const json &scene, const std::string &field_name)
- void checkJsonExistencePrimitive (const json &scene)
- void checkRangeValue (const json &scene, const std::string &field_name, const std::string &comparison_↩ sign, double value)

Private Attributes

- Math::Point3D crossingPoint_
- Math::Vector3D rotation_
- double angle_

Additional Inherited Members

6.6.1 Constructor & Destructor Documentation

6.6.1.1 Cone() [1/2]

```
RayTracer::Cone::Cone (
            Math::Point3D crossingPoint,
            double angle )
```

6.6.1.2 Cone() [2/2]

```
RayTracer::Cone::Cone ( )  [default]
```

6.6.2 Member Function Documentation

6.6.2.1 checkJsonExistence()

```
void RayTracer::Cone::checkJsonExistence (
            const json & scene,
            const std::string & field_name )  [private]
```

6.6.2.2 checkJsonExistencePrimitive()

```
void RayTracer::Cone::checkJsonExistencePrimitive (
            const json & scene ) [private]
```

6.6.2.3 checkRangeValue()

```
void RayTracer::Cone::checkRangeValue (
            const json & scene,
            const std::string & field_name,
            const std::string & comparison_sign,
            double value ) [private]
```

6.6.2.4 getIntersection()

```
std::vector< double > RayTracer::Cone::getIntersection (
            RayTracer::Ray ray ) [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.6.2.5 getNormalVector()

```
Math::Vector3D RayTracer::Cone::getNormalVector (
            Math::Point3D point ) [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.6.2.6 getRotationVector()

```
Math::Vector3D RayTracer::Cone::getRotationVector ( ) [virtual]
```

Implements RayTracer::IPrimitives.

6.6.2.7 parseInfo()

```
void RayTracer::Cone::parseInfo (
            json object ) [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.6.3 Field Documentation

6.6.3.1 angle_

```
double RayTracer::Cone::angle_  [private]
```

6.6.3.2 crossingPoint_

```
Math::Point3D RayTracer::Cone::crossingPoint_  [private]
```

6.6.3.3 rotation_

```
Math::Vector3D RayTracer::Cone::rotation_  [private]
```

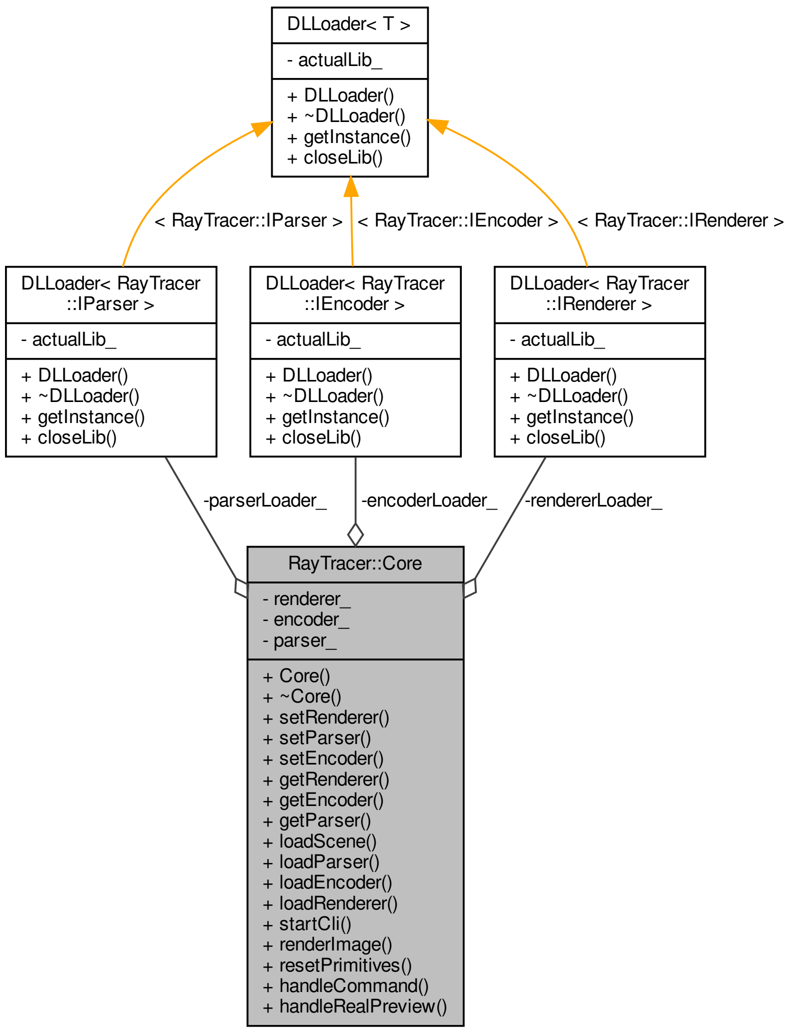
The documentation for this class was generated from the following files:

- src/plugins/primitives/cone/Cone.hpp
- src/plugins/primitives/cone/Cone.cpp

6.7 RayTracer::Core Class Reference

```
#include <Core.hpp>
```

Collaboration diagram for RayTracer::Core:



Public Member Functions

- Core ()=default
- ∼Core ()=default
- void setRenderer (std::unique_ptr< IRenderer > renderer)
- void setParser (std::unique_ptr< IParser > parser)
- void setEncoder (std::unique_ptr< IEncoder > encoder)
- std::unique_ptr< IRenderer > & getRenderer ()
- std::unique_ptr< IEncoder > & getEncoder ()
- std::unique_ptr< IParser > & getParser ()
- void loadScene ()
- void loadParser (const std::string &name)
- void loadEncoder (const std::string &name)
- void loadRenderer (const std::string &name)
- void startCli (const char ∗config)

Starts the command-line interface with the specified configuration.
- void renderImage ()

    Renders the final image of the scene.
- void resetPrimitives ()

    Resets the primitives in the scene.

Static Public Member Functions

- static void handleCommand ()

    Handles a command received through the command-line interface.
- static bool handleRealPreview ()

    Handles real-time preview of the scene.

Private Attributes

- DLLoader< IEncoder > encoderLoader_
- DLLoader< IRenderer > rendererLoader_
- DLLoader< IParser > parserLoader_
- std::unique_ptr< IRenderer > renderer_ { nullptr }
- std::unique_ptr< IEncoder > encoder_ { nullptr }
- std::unique_ptr< IParser > parser_ { nullptr }

6.7.1 Constructor & Destructor Documentation

6.7.1.1 Core()

```
RayTracer::Core::Core ( )  [default]
```

6.7.1.2 ∼Core()

```
RayTracer::Core::∼Core ( )  [default]
```

6.7.2 Member Function Documentation

6.7.2.1 getEncoder()

```
std::unique_ptr< IEncoder > & RayTracer::Core::getEncoder ( )
```

Get the encoder of the scene.

Returns

A reference to a unique pointer to the IEncoder object.

6.7.2.2 getParser()

```
std::unique_ptr< IParser > & RayTracer::Core::getParser ( )
```

Get the parser of the scene.

Returns

A reference to a unique pointer to the IParser object.

6.7.2.3 getRenderer()

```
std::unique_ptr< IRenderer > & RayTracer::Core::getRenderer ( )
```

Get the renderer of the scene.

Returns

A reference to a unique pointer to the IRenderer object.

6.7.2.4 handleCommand()

```
void RayTracer::Core::handleCommand ( )  [static]
```

Handles a command received through the command-line interface.

6.7.2.5 handleRealPreview()

```
bool RayTracer::Core::handleRealPreview ( )  [static]
```

Handles real-time preview of the scene.

Returns

True if the real-time preview is successfully handled, False otherwise.

6.7.2.6 loadEncoder()

```
void RayTracer::Core::loadEncoder (
             const std::string & name )
```

Load an encoder by its name.

Parameters

name	A constant reference to the string name of the encoder.

6.7.2.7 loadParser()

```
void RayTracer::Core::loadParser (
             const std::string & name )
```

Load a parser by its name.

Parameters

name	A constant reference to the string name of the parser.

6.7.2.8 loadRenderer()

```
void RayTracer::Core::loadRenderer (
             const std::string & name )
```

Load a renderer by its name.

Parameters

name	A constant reference to the string name of the renderer.

6.7.2.9 loadScene()

```
void RayTracer::Core::loadScene ( )
```

Load the scene.

Exceptions

throw	an exception if the scene cannot be loaded

6.7.2.10 renderImage()

```
void RayTracer::Core::renderImage ( )
```

Renders the final image of the scene.

6.7.2.11 resetPrimitives()

```
void RayTracer::Core::resetPrimitives ( )
```

Resets the primitives in the scene.

6.7.2.12 setEncoder()

```
void RayTracer::Core::setEncoder (
             std::unique_ptr< IEncoder > encoder )
```

Set the encoder for the scene.

Parameters

encoder	A unique pointer to the IEncoder object.

6.7.2.13 setParser()

```
void RayTracer::Core::setParser (
             std::unique_ptr< IParser > parser )
```

Set the parser for the scene.

Parameters

parser	A unique pointer to the IParser object.

6.7.2.14 setRenderer()

```
void RayTracer::Core::setRenderer (
             std::unique_ptr< IRenderer > renderer )
```

Set the renderer for the scene.

Parameters

renderer	A unique pointer to the IRenderer object.

6.7.2.15 startCli()

```
void RayTracer::Core::startCli (
             const char * config )
```

Starts the command-line interface with the specified configuration.

Parameters

config	The configuration file to use.

6.7.3 Field Documentation

6.7.3.1 encoder_

```
std::unique_ptr<IEncoder> RayTracer::Core::encoder_ { nullptr }  [private]
```

6.7.3.2 encoderLoader_

```
DLLoader<IEncoder> RayTracer::Core::encoderLoader_  [private]
```

6.7.3.3 parser_

```
std::unique_ptr<IParser> RayTracer::Core::parser_ { nullptr }  [private]
```

6.7.3.4 parserLoader_

```
DLLoader<IParser> RayTracer::Core::parserLoader_  [private]
```

6.7.3.5 renderer_

```
std::unique_ptr<IRenderer> RayTracer::Core::renderer_ { nullptr }  [private]
```

6.7.3.6 rendererLoader_

```
DLLoader<IRenderer> RayTracer::Core::rendererLoader_  [private]
```

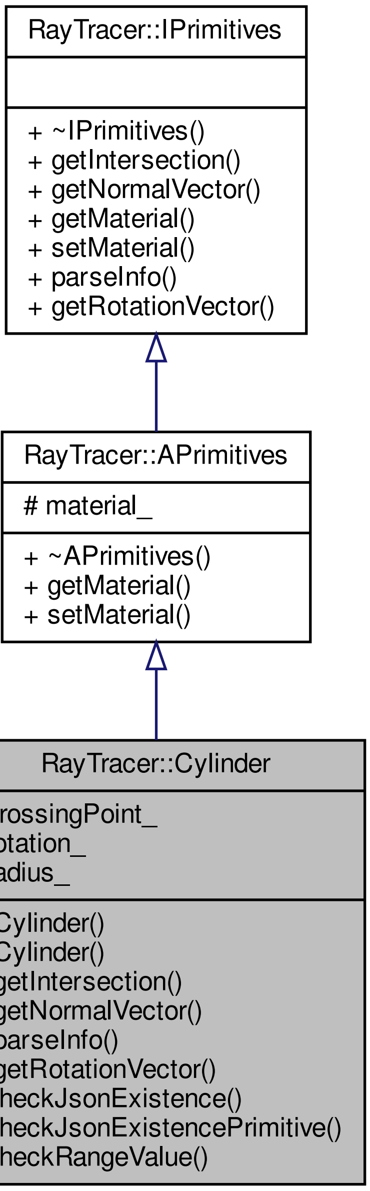
The documentation for this class was generated from the following files:

- include/Core.hpp
- src/Core.cpp

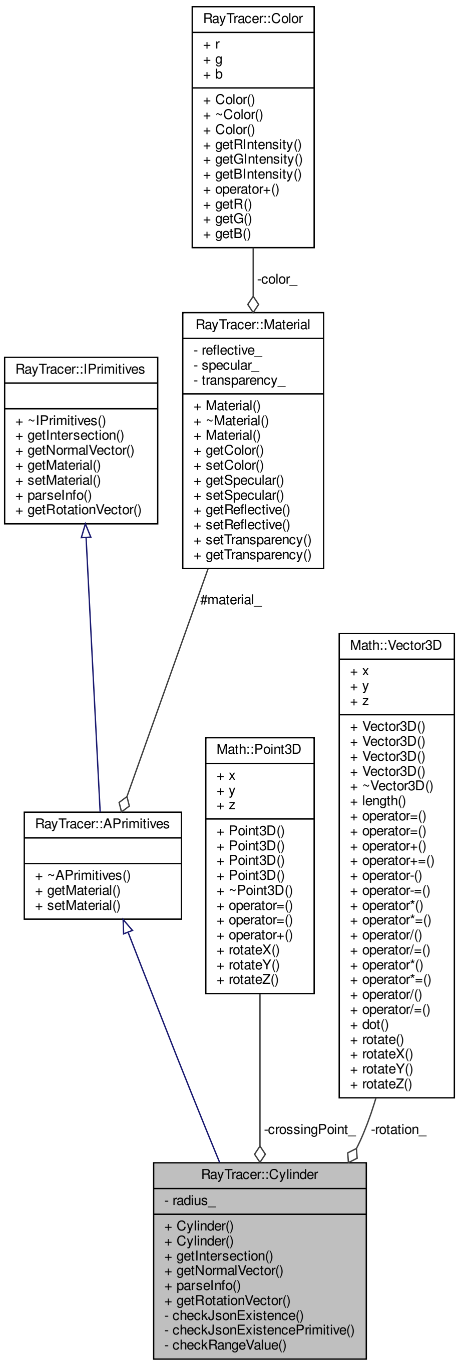
6.8 RayTracer::Cylinder Class Reference

```
#include <Cylinder.hpp>
```

Inheritance diagram for RayTracer::Cylinder:



Collaboration diagram for RayTracer::Cylinder:



Public Member Functions

- Cylinder (Math::Point3D crossingPoint, double radius)
- Cylinder ()=default
- std::vector< double > getIntersection (RayTracer::Ray ray) final
- Math::Vector3D getNormalVector (Math::Point3D point) final
- void parseInfo (json object) final
- Math::Vector3D getRotationVector ()

Private Member Functions

- void checkJsonExistence (const json &scene, const std::string &field_name)
- void checkJsonExistencePrimitive (const json &scene)
- void checkRangeValue (const json &scene, const std::string &field_name, const std::string &comparison_↩
  sign, double value)

Private Attributes

- Math::Point3D crossingPoint_
- Math::Vector3D rotation_
- double radius_

Additional Inherited Members

6.8.1 Constructor & Destructor Documentation

6.8.1.1 Cylinder() [1/2]

```
RayTracer::Cylinder::Cylinder (
            Math::Point3D crossingPoint,
            double radius )
```

6.8.1.2 Cylinder() [2/2]

```
RayTracer::Cylinder::Cylinder ( )  [default]
```

6.8.2 Member Function Documentation

6.8.2.1 checkJsonExistence()

```
void RayTracer::Cylinder::checkJsonExistence (
            const json & scene,
            const std::string & field_name )  [private]
```

6.8.2.2 checkJsonExistencePrimitive()

```
void RayTracer::Cylinder::checkJsonExistencePrimitive (
             const json & scene )  [private]
```

6.8.2.3 checkRangeValue()

```
void RayTracer::Cylinder::checkRangeValue (
             const json & scene,
             const std::string & field_name,
             const std::string & comparison_sign,
             double value )  [private]
```

6.8.2.4 getIntersection()

```
std::vector< double > RayTracer::Cylinder::getIntersection (
             RayTracer::Ray ray )  [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.8.2.5 getNormalVector()

```
Math::Vector3D RayTracer::Cylinder::getNormalVector (
             Math::Point3D point )  [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.8.2.6 getRotationVector()

```
Math::Vector3D RayTracer::Cylinder::getRotationVector ( )  [virtual]
```

Implements RayTracer::IPrimitives.

6.8.2.7 parseInfo()

```
void RayTracer::Cylinder::parseInfo (
             json object )  [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.8.3 Field Documentation

6.8.3.1 crossingPoint_

```
Math::Point3D RayTracer::Cylinder::crossingPoint_  [private]
```

6.8.3.2 radius_

```
double RayTracer::Cylinder::radius_  [private]
```

6.8.3.3 rotation_

```
Math::Vector3D RayTracer::Cylinder::rotation_  [private]
```

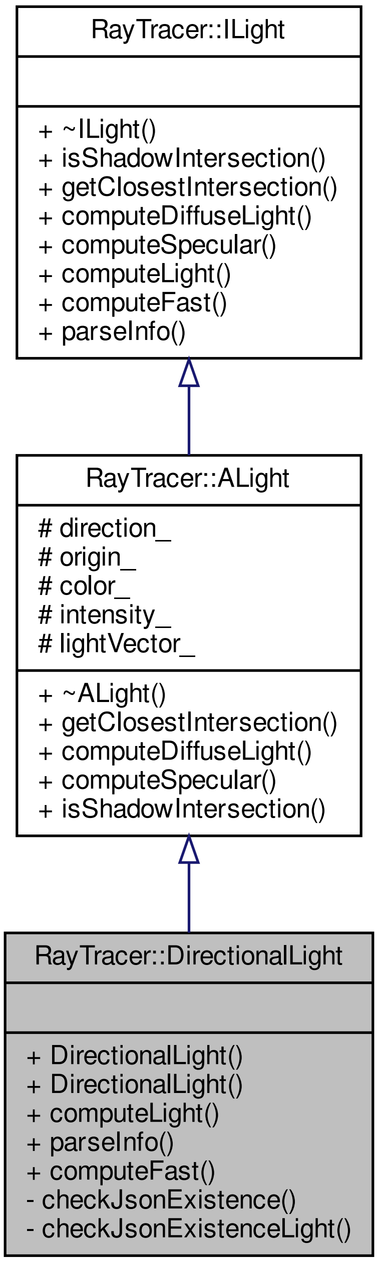
The documentation for this class was generated from the following files:

- src/plugins/primitives/cylinder/Cylinder.hpp
- src/plugins/primitives/cylinder/Cylinder.cpp

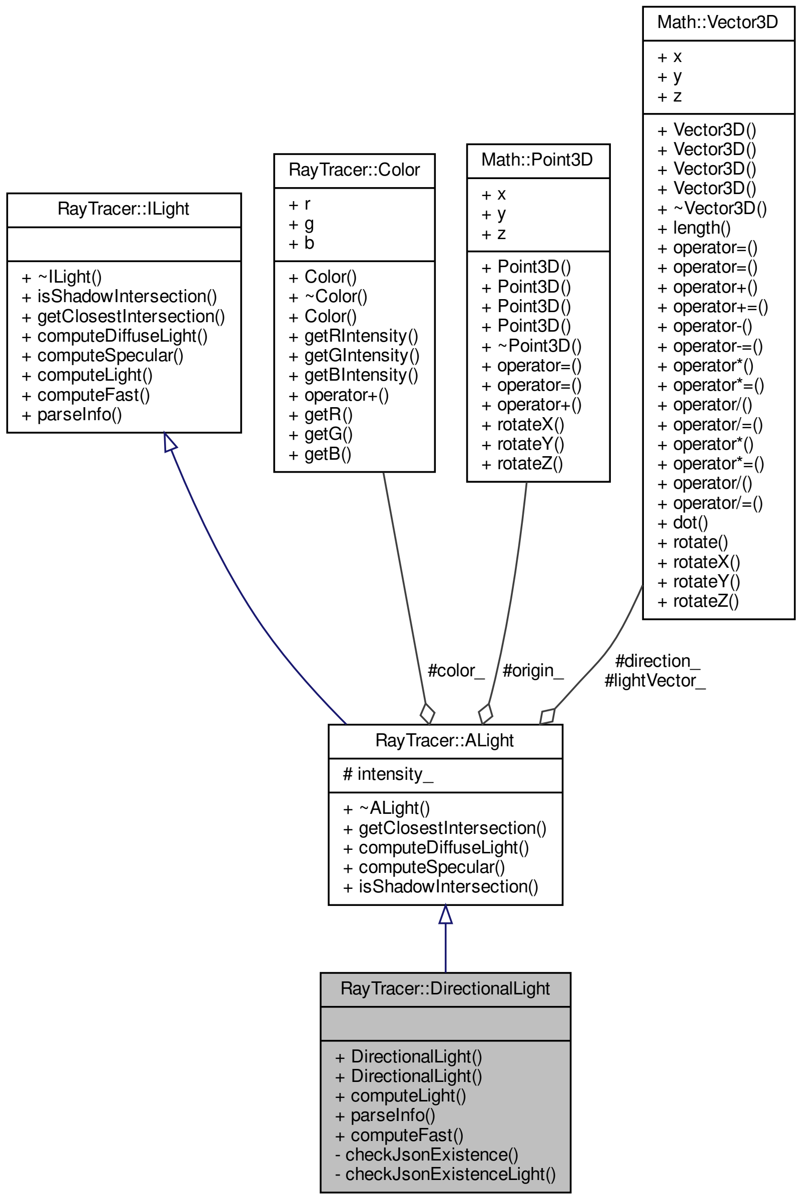
6.9 RayTracer::DirectionalLight Class Reference

```
#include <DirectionalLight.hpp>
```

Inheritance diagram for RayTracer::DirectionalLight:



Collaboration diagram for RayTracer::DirectionalLight:



Public Member Functions

- DirectionalLight ()=default
- DirectionalLight (Color color, double intensity, Math::Vector3D direction)
- Color computeLight (Math::Vector3D normalVector, int spec, Math::Point3D intersectionPoint, Math::Vector3D rayDir, std::vector< std::unique_ptr< IPrimitives >> &primitives) final
- void parseInfo (json object) final

  Information parser to create the light object.
- Color computeFast (Math::Vector3D normalVector, int spec, Math::Point3D intersectionPoint, Math::Vector3D rayDir, std::vector< std::unique_ptr< IPrimitives >> &primitives) final

Private Member Functions

- void checkJsonExistence (const json &scene, const std::string &field_name)
- void checkJsonExistenceLight (const json &scene)

Additional Inherited Members

6.9.1 Constructor & Destructor Documentation

6.9.1.1 DirectionalLight() [1/2]

```
RayTracer::DirectionalLight::DirectionalLight ( )  [default]
```

6.9.1.2 DirectionalLight() [2/2]

```
RayTracer::DirectionalLight::DirectionalLight (
            Color color,
            double intensity,
            Math::Vector3D direction )
```

6.9.2 Member Function Documentation

6.9.2.1 checkJsonExistence()

```
void RayTracer::DirectionalLight::checkJsonExistence (
            const json & scene,
            const std::string & field_name )  [private]
```

6.9.2.2 checkJsonExistenceLight()

```
void RayTracer::DirectionalLight::checkJsonExistenceLight (
            const json & scene )  [private]
```

6.9.2.3 computeFast()

```
Color RayTracer::DirectionalLight::computeFast (
            Math::Vector3D normalVector,
            int spec,
            Math::Point3D intersectionPoint,
            Math::Vector3D rayDir,
            std::vector< std::unique_ptr< IPrimitives >> & primitives )  [final], [virtual]
```

Implements RayTracer::ILight.

6.9.2.4 computeLight()

```
Color RayTracer::DirectionalLight::computeLight (
            Math::Vector3D normalVector,
            int spec,
            Math::Point3D intersectionPoint,
            Math::Vector3D rayDir,
            std::vector< std::unique_ptr< IPrimitives >> & primitives )  [final], [virtual]
```

Implements RayTracer::ILight.

6.9.2.5 parseInfo()

```
void RayTracer::DirectionalLight::parseInfo (
            json object )  [final], [virtual]
```

Information parser to create the light object.

Parameters

object	the json object containing light info

Implements RayTracer::ILight.

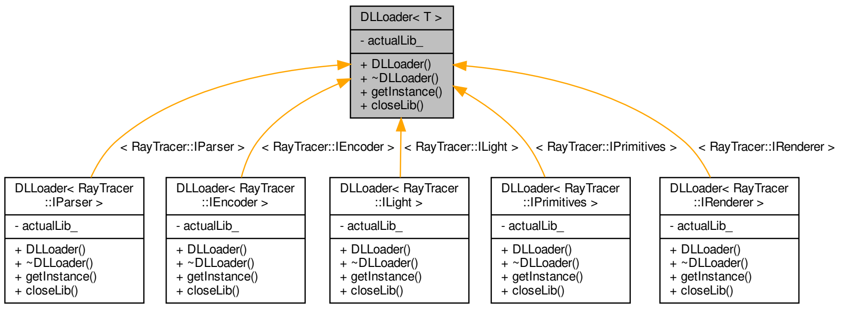
The documentation for this class was generated from the following files:

- src/plugins/lights/directional/DirectionalLight.hpp
- src/plugins/lights/directional/DirectionalLight.cpp

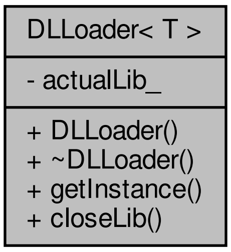
6.10 DLLoader< T > Class Template Reference

```
#include <DLLoader.hpp>
```

Inheritance diagram for DLLoader< T >:


DLLoader< T >
- actualLib_
+ DLLoader()
+ ~DLLoader()
+ getInstance()
+ closeLib()
< RayTracer::IParser >
< RayTracer::IEncoder >
< RayTracer::ILight >
< RayTracer::IPrimitives >
< RayTracer::IRenderer >
DLLoader< RayTracer ::IParser >
DLLoader< RayTracer ::IEncoder >
DLLoader< RayTracer ::ILight >
DLLoader< RayTracer ::IPrimitives >
DLLoader< RayTracer ::IRenderer >

Collaboration diagram for DLLoader< T >:



Public Member Functions

- DLLoader ()=default
- ∼DLLoader ()=default
- std::unique_ptr< T > getInstance (const std::string &filename)
- void closeLib ()

Private Attributes

- void ∗ actualLib_ { nullptr }

6.10.1 Constructor & Destructor Documentation

6.10.1.1 DLLoader()

```
template<typename T >
DLLoader< T >::DLLoader ( )  [default]
```

6.10.1.2 ~DLLoader()

```
template<typename T >
DLLoader< T >::~DLLoader ( )  [default]
```

6.10.2 Member Function Documentation

6.10.2.1 closeLib()

```
template<typename T >
void DLLoader< T >::closeLib ( )  [inline]
```

6.10.2.2 getInstance()

```
template<typename T >
std::unique_ptr<T> DLLoader< T >::getInstance (
             const std::string & filename )  [inline]
```

6.10.3 Field Documentation

6.10.3.1 actualLib_

```
template<typename T >
void* DLLoader< T >::actualLib_ { nullptr }  [private]
```

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

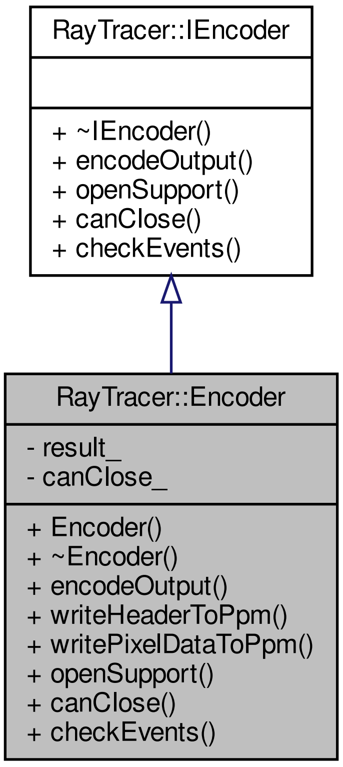
- include/DLLoader.hpp

6.11 RayTracer::Encoder Class Reference

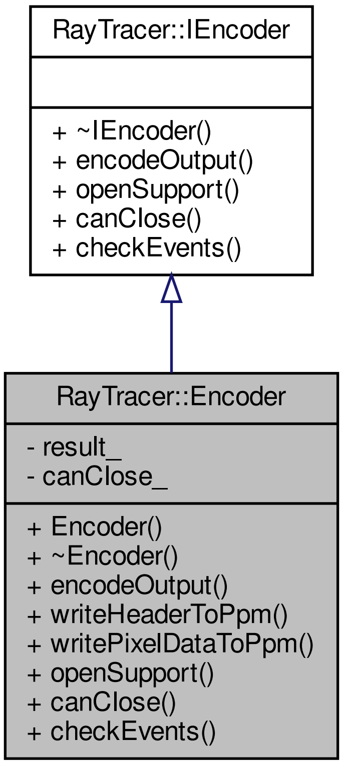
Encoder class.

```
#include <Encoder.hpp>
```

Inheritance diagram for RayTracer::Encoder:



Collaboration diagram for RayTracer::Encoder:



Public Member Functions

- Encoder ()=default
- ∼Encoder ()=default
- void encodeOutput (std::vector< std::vector< Color >> result_, const std::string &filename) override
- void writeHeaderToPpm (std::ofstream &ofs, long unsigned int width, long unsigned int height)
- void writePixelDataToPpm (std::ofstream &ofs, const std::vector< std::vector< Color >> &result_)
- void openSupport (const std::string &name, imageSize size) override

  Opens the necessary support for encoding.
- bool canClose () override

  Checks if the encoder can be closed.
- void checkEvents () override

  Checks for any pending events or actions.

Private Attributes

- std::vector< std::vector< Color > > result_
- bool canClose_ { true }

6.11.1 Detailed Description

Encoder class.

6.11.2 Constructor & Destructor Documentation

6.11.2.1 Encoder()

```
RayTracer::Encoder::Encoder ( )  [default]
```

6.11.2.2 ∼Encoder()

```
RayTracer::Encoder::∼Encoder ( )  [default]
```

6.11.3 Member Function Documentation

6.11.3.1 canClose()

```
bool RayTracer::Encoder::canClose ( )  [override], [virtual]
```

Checks if the encoder can be closed.

Returns

True if the encoder can be closed, False otherwise

Implements RayTracer::IEncoder.

6.11.3.2 checkEvents()

```
void RayTracer::Encoder::checkEvents ( )  [override], [virtual]
```

Checks for any pending events or actions.

Implements RayTracer::IEncoder.

6.11.3.3 encodeOutput()

```
void RayTracer::Encoder::encodeOutput (
            std::vector< std::vector< Color >> result_,
            const std::string & filename )  [override], [virtual]
```

Parameters

result←↩ _	
filename	

Implements RayTracer::IEncoder.

6.11.3.4 openSupport()

```
void RayTracer::Encoder::openSupport (
             const std::string & name,
             imageSize size )  [override], [virtual]
```

Opens the necessary support for encoding.

Parameters

name	The name of the support to be opened
size	The size of the image to be encoded

Implements RayTracer::IEncoder.

6.11.3.5 writeHeaderToPpm()

```
void RayTracer::Encoder::writeHeaderToPpm (
             std::ofstream & ofs,
             long unsigned int width,
             long unsigned int height )
```

Parameters

ofs	
width	
height	

6.11.3.6 writePixelDataToPpm()

```
void RayTracer::Encoder::writePixelDataToPpm (
             std::ofstream & ofs,
             const std::vector< std::vector< Color >> & result_ )
```

Parameters

ofs	
result↩ _	

6.11.4 Field Documentation

6.11.4.1 canClose_

```
bool RayTracer::Encoder::canClose_ { true }  [private]
```

6.11.4.2 result_

```
std::vector<std::vector<Color> > RayTracer::Encoder::result_  [private]
```

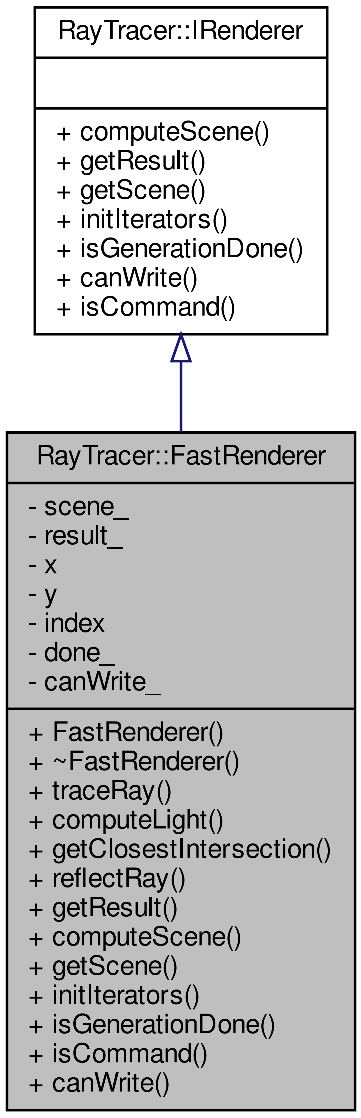
The documentation for this class was generated from the following files:

- src/plugins/encoder/ppmEncoder/Encoder.hpp
- src/plugins/encoder/ppmEncoder/Encoder.cpp

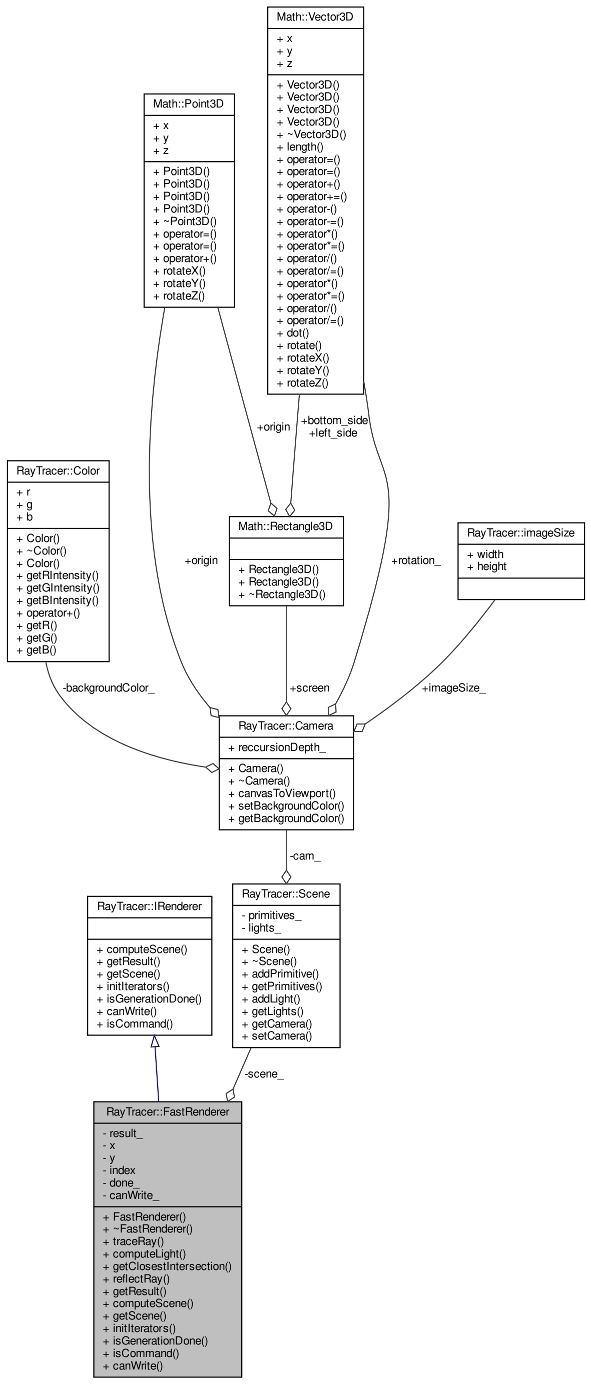
6.12 RayTracer::FastRenderer Class Reference

```
#include <Renderer.hpp>
```

Inheritance diagram for RayTracer::FastRenderer:



Collaboration diagram for RayTracer::FastRenderer:



Public Member Functions

- FastRenderer ()=default
- ∼FastRenderer ()=default
- Color traceRay (RayTracer::Ray ray, double tMin, double tMax, int recursion_depth)
- Color computeLight (Math::Point3D intersectionPoint, Math::Vector3D normalVector, Math::Vector3D rayDir, int spec)

- intersection getClosestIntersection (RayTracer::Ray ray, double tMin, double tMax)
- Math::Vector3D reflectRay (Math::Vector3D normalVector, Math::Vector3D ray)
- std::vector< std::vector< Color > > getResult () override

  Get the result of the rendering as a 2D vector of colors.
- void computeScene () override

  Compute the scene and render the result.
- Scene & getScene () override

  Get the scene used for rendering.
- void initIterators () override

  Initializes the iterators for generation.
- bool isGenerationDone () override

  Checks if the generation process is done.
- bool isCommand () override

  Checks if the current action is a command.
- bool canWrite () override

  Checks if writing is allowed.

Private Attributes

- Scene scene_ {}
- std::vector< std::vector< Color > > result_
- double x
- double y
- std::size_t index = 0
- bool done_ { false }
- bool canWrite_ { false }

6.12.1 Constructor & Destructor Documentation

6.12.1.1 FastRenderer()

```
RayTracer::FastRenderer::FastRenderer ( )  [default]
```

6.12.1.2 ∼FastRenderer()

```
RayTracer::FastRenderer::∼FastRenderer ( )  [default]
```

6.12.2 Member Function Documentation

6.12.2.1 canWrite()

```
bool RayTracer::FastRenderer::canWrite ( )  [override], [virtual]
```

Checks if writing is allowed.

Returns

True if writing is allowed, False otherwise

Implements RayTracer::IRenderer.

6.12.2.2 computeLight()

```
Color RayTracer::FastRenderer::computeLight (
            Math::Point3D intersectionPoint,
            Math::Vector3D normalVector,
            Math::Vector3D rayDir,
            int spec )
```

6.12.2.3 computeScene()

```
void RayTracer::FastRenderer::computeScene ( )  [override], [virtual]
```

Compute the scene and render the result.

Implements RayTracer::IRenderer.

6.12.2.4 getClosestIntersection()

```
intersection RayTracer::FastRenderer::getClosestIntersection (
            RayTracer::Ray ray,
            double tMin,
            double tMax )
```

6.12.2.5 getResult()

```
std::vector< std::vector< Color > > RayTracer::FastRenderer::getResult ( )  [override], [virtual]
```

Get the result of the rendering as a 2D vector of colors.

Returns

The result of the rendering as a 2D vector of colors.

Implements RayTracer::IRenderer.

6.12.2.6 getScene()

```
Scene & RayTracer::FastRenderer::getScene ( )  [override], [virtual]
```

Get the scene used for rendering.

Returns

The scene used for rendering.

Implements RayTracer::IRenderer.

6.12.2.7 initIterators()

```
void RayTracer::FastRenderer::initIterators ( )  [override], [virtual]
```

Initializes the iterators for generation.

Implements RayTracer::IRenderer.

6.12.2.8 isCommand()

```
bool RayTracer::FastRenderer::isCommand ( )  [override], [virtual]
```

Checks if the current action is a command.

Returns

True if the current action is a command, False otherwise

Implements RayTracer::IRenderer.

6.12.2.9 isGenerationDone()

```
bool RayTracer::FastRenderer::isGenerationDone ( )  [override], [virtual]
```

Checks if the generation process is done.

Returns

True if the generation is done, False otherwise

Implements RayTracer::IRenderer.

6.12.2.10 reflectRay()

```
Math::Vector3D RayTracer::FastRenderer::reflectRay (
            Math::Vector3D normalVector,
            Math::Vector3D ray )
```

6.12.2.11 traceRay()

```
Color RayTracer::FastRenderer::traceRay (
            RayTracer::Ray ray,
            double tMin,
            double tMax,
            int recursion_depth )
```

6.12.3 Field Documentation

6.12.3.1 canWrite_

```
bool RayTracer::FastRenderer::canWrite_ { false }  [private]
```

6.12.3.2 done_

```
bool RayTracer::FastRenderer::done_ { false }  [private]
```

6.12.3.3 index

```
std::size_t RayTracer::FastRenderer::index = 0  [private]
```

6.12.3.4 result_

```
std::vector<std::vector<Color> > RayTracer::FastRenderer::result_  [private]
```

6.12.3.5 scene_

```
Scene RayTracer::FastRenderer::scene_ {}  [private]
```

6.12.3.6 x

```
double RayTracer::FastRenderer::x  [private]
```

6.12.3.7 y

```
double RayTracer::FastRenderer::y  [private]
```

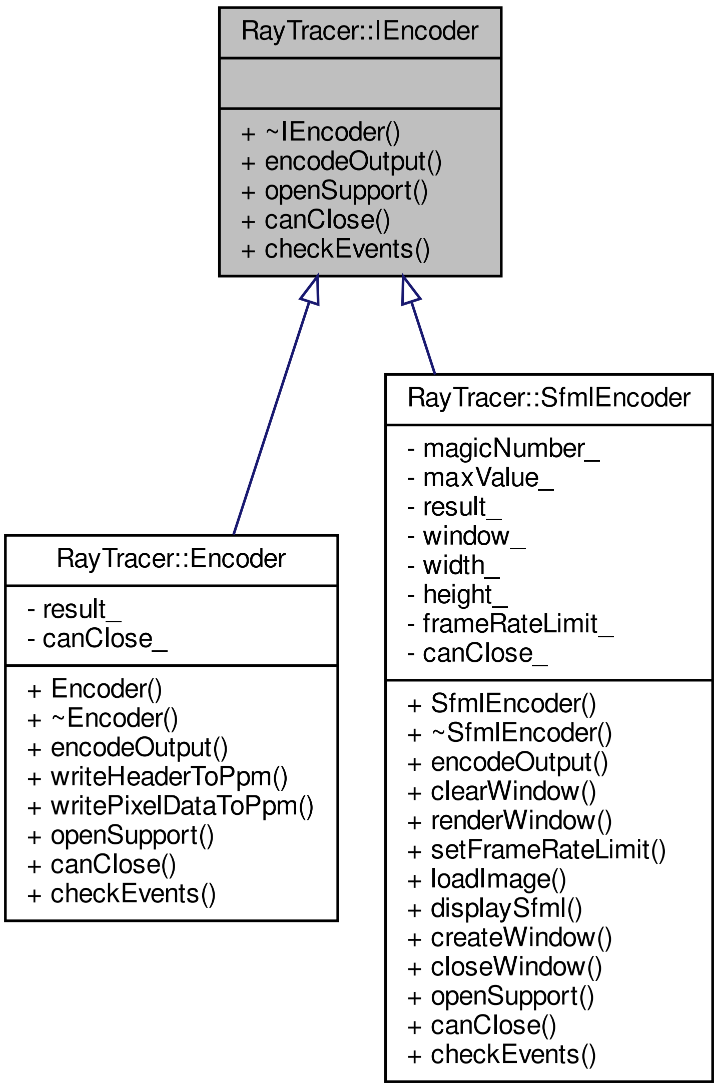
The documentation for this class was generated from the following files:

- src/plugins/renderer/fastRenderer/Renderer.hpp
- src/plugins/renderer/fastRenderer/Renderer.cpp

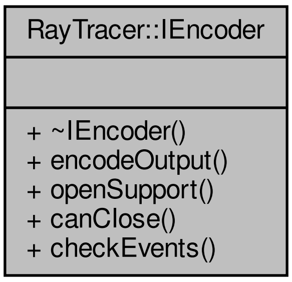
6.13 RayTracer::IEncoder Class Reference

```
#include <IEncoder.hpp>
```

Inheritance diagram for RayTracer::IEncoder:



Collaboration diagram for RayTracer::IEncoder:



Public Member Functions

- virtual ∼IEncoder ()=default
- virtual void encodeOutput (std::vector< std::vector< Color >> result, const std::string &filename)=0

  Encodes and saves the rendering result to an output file.
- virtual void openSupport (const std::string &name, imageSize size)=0

  Opens the necessary support for encoding.
- virtual bool canClose ()=0

  Checks if the encoder can be closed.
- virtual void checkEvents ()=0

  Checks for any pending events or actions.

6.13.1 Constructor & Destructor Documentation

6.13.1.1 ∼IEncoder()

```
virtual RayTracer::IEncoder::∼IEncoder ( )  [virtual], [default]
```

6.13.2 Member Function Documentation

6.13.2.1 canClose()

```
virtual bool RayTracer::IEncoder::canClose ( )  [pure virtual]
```

Checks if the encoder can be closed.

Returns

True if the encoder can be closed, False otherwise

Implemented in RayTracer::SfmlEncoder, and RayTracer::Encoder.

6.13.2.2 checkEvents()

```
virtual void RayTracer::IEncoder::checkEvents ( )  [pure virtual]
```

Checks for any pending events or actions.

Implemented in RayTracer::SfmlEncoder, and RayTracer::Encoder.

6.13.2.3 encodeOutput()

```
virtual void RayTracer::IEncoder::encodeOutput (
            std::vector< std::vector< Color >> result,
            const std::string & filename )  [pure virtual]
```

Encodes and saves the rendering result to an output file.

Parameters

result	The rendering result as a 2D vector of colors
filename	The filename of the output file

Implemented in RayTracer::SfmlEncoder, and RayTracer::Encoder.

6.13.2.4 openSupport()

```
virtual void RayTracer::IEncoder::openSupport (
            const std::string & name,
            imageSize size )  [pure virtual]
```

Opens the necessary support for encoding.

Parameters

name	The name of the support to be opened
size	The size of the image to be encoded

Implemented in RayTracer::SfmlEncoder, and RayTracer::Encoder.

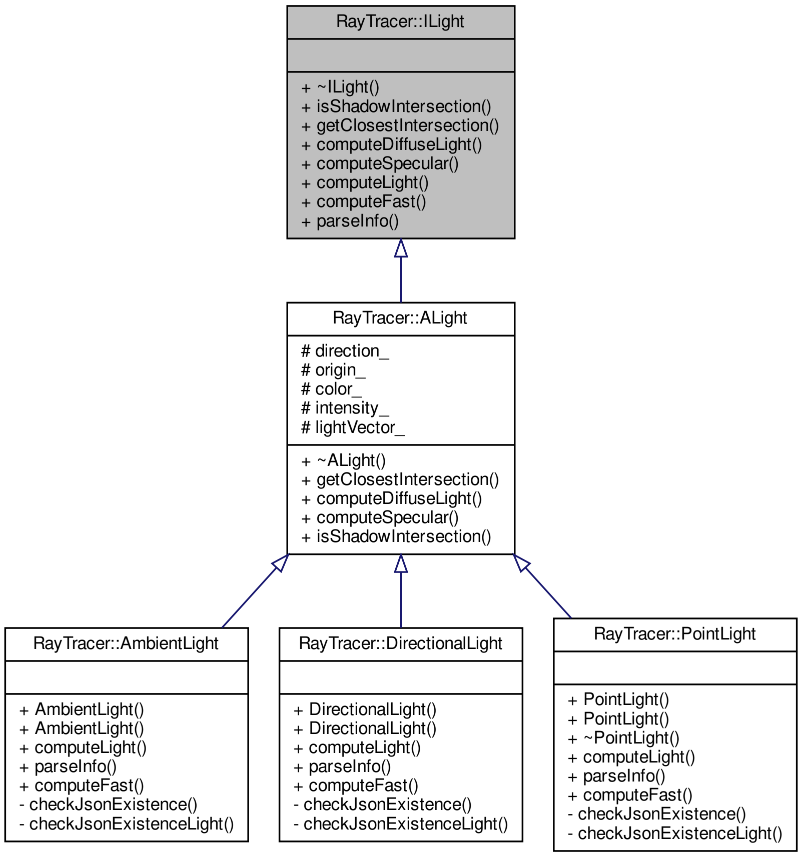
The documentation for this class was generated from the following file:

- include/encoder/IEncoder.hpp

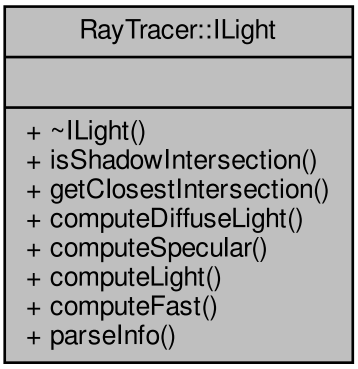
6.14 RayTracer::ILight Class Reference

```
#include <ILight.hpp>
```

Inheritance diagram for RayTracer::ILight:



Collaboration diagram for RayTracer::ILight:



Public Member Functions

- virtual ∼ILight ()=default
- virtual bool isShadowIntersection (Math::Point3D intersectionPoint, std::vector< std::unique_ptr< IPrimitives >> &primitives)=0
- virtual intersection getClosestIntersection (RayTracer::Ray ray, double tMin, double tMax, std::vector< std↩ ::unique_ptr< IPrimitives >> &primitives)=0
- virtual Color computeDiffuseLight (Math::Vector3D normalVector)=0
- virtual Color computeSpecular (Math::Vector3D normalVector, int spec, Math::Vector3D rayDir)=0
- virtual Color computeLight (Math::Vector3D normalVector, int spec, Math::Point3D intersectionPoint, Math::Vector3D rayDir, std::vector< std::unique_ptr< IPrimitives >> &primitives)=0
- virtual Color computeFast (Math::Vector3D normalVector, int spec, Math::Point3D intersectionPoint, Math::Vector3D rayDir, std::vector< std::unique_ptr< IPrimitives >> &primitives)=0
- virtual void parseInfo (json object)=0

  Information parser to create the light object.

6.14.1 Constructor & Destructor Documentation

6.14.1.1 ∼ILight()

```
virtual RayTracer::ILight::∼ILight ( )  [virtual], [default]
```

6.14.2 Member Function Documentation

6.14.2.1 computeDiffuseLight()

```
virtual Color RayTracer::ILight::computeDiffuseLight (
            Math::Vector3D normalVector )  [pure virtual]
```

Implemented in RayTracer::ALight.

6.14.2.2 computeFast()

```
virtual Color RayTracer::ILight::computeFast (
            Math::Vector3D normalVector,
            int spec,
            Math::Point3D intersectionPoint,
            Math::Vector3D rayDir,
            std::vector< std::unique_ptr< IPrimitives >> & primitives )  [pure virtual]
```

Implemented in RayTracer::PointLight, RayTracer::DirectionalLight, and RayTracer::AmbientLight.

6.14.2.3 computeLight()

```
virtual Color RayTracer::ILight::computeLight (
            Math::Vector3D normalVector,
            int spec,
            Math::Point3D intersectionPoint,
            Math::Vector3D rayDir,
            std::vector< std::unique_ptr< IPrimitives >> & primitives )  [pure virtual]
```

Implemented in RayTracer::PointLight, RayTracer::DirectionalLight, and RayTracer::AmbientLight.

6.14.2.4 computeSpecular()

```
virtual Color RayTracer::ILight::computeSpecular (
            Math::Vector3D normalVector,
            int spec,
            Math::Vector3D rayDir )  [pure virtual]
```

Implemented in RayTracer::ALight.

6.14.2.5 getClosestIntersection()

```
virtual intersection RayTracer::ILight::getClosestIntersection (
            RayTracer::Ray ray,
            double tMin,
            double tMax,
            std::vector< std::unique_ptr< IPrimitives >> & primitives )  [pure virtual]
```

Implemented in RayTracer::ALight.

6.14.2.6 isShadowIntersection()

```
virtual bool RayTracer::ILight::isShadowIntersection (
            Math::Point3D intersectionPoint,
            std::vector< std::unique_ptr< IPrimitives >> & primitives )  [pure virtual]
```

Implemented in RayTracer::ALight.

6.14.2.7 parseInfo()

```
virtual void RayTracer::ILight::parseInfo (
            json object )  [pure virtual]
```

Information parser to create the light object.

Parameters

object	the json object containing light info

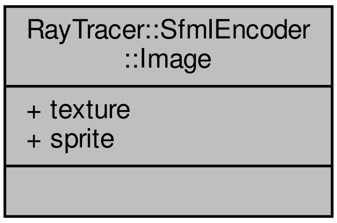
Implemented in RayTracer::PointLight, RayTracer::DirectionalLight, and RayTracer::AmbientLight.

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

- include/lights/ILight.hpp

6.15 RayTracer::SfmlEncoder::Image Struct Reference

Collaboration diagram for RayTracer::SfmlEncoder::Image:



Data Fields

- sf::Texture texture
- sf::Sprite sprite

6.15.1 Field Documentation

6.15.1.1 sprite

```
sf::Sprite RayTracer::SfmlEncoder::Image::sprite
```

6.15.1.2 texture

```
sf::Texture RayTracer::SfmlEncoder::Image::texture
```

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

- src/plugins/encoder/sfmlEncoder/Encoder.hpp

6.16 RayTracer::imageSize Struct Reference

```
#include <Size.hpp>
```

Collaboration diagram for RayTracer::imageSize:

Data Fields

- double width
- double height

6.16.1 Field Documentation

6.16.1.1 height

```
double RayTracer::imageSize::height
```

6.16.1.2 width

```
double RayTracer::imageSize::width
```

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

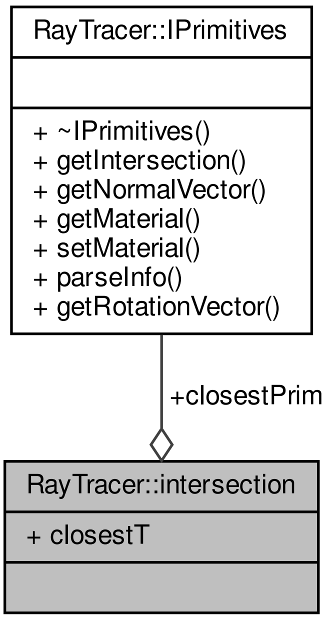
- include/Size.hpp

6.17 RayTracer::intersection Struct Reference

Struct for the intersection.

```
#include <RayTracer.hpp>
```

Collaboration diagram for RayTracer::intersection:



Data Fields

- IPrimitives & closestPrim
- double closestT

6.17.1 Detailed Description

Struct for the intersection.

6.17.2 Field Documentation

6.17.2.1 closestPrim

```
IPrimitives& RayTracer::intersection::closestPrim
```

6.17.2.2 closestT

```
double RayTracer::intersection::closestT
```

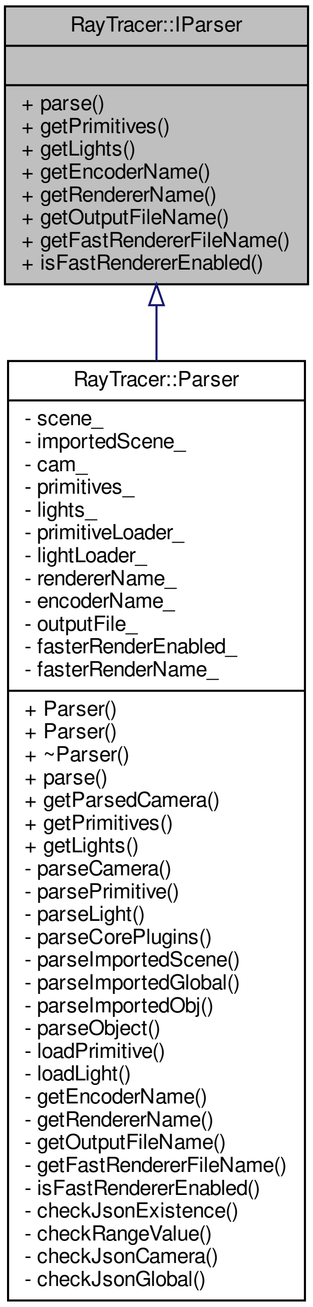
The documentation for this struct was generated from the following file:

- include/RayTracer.hpp

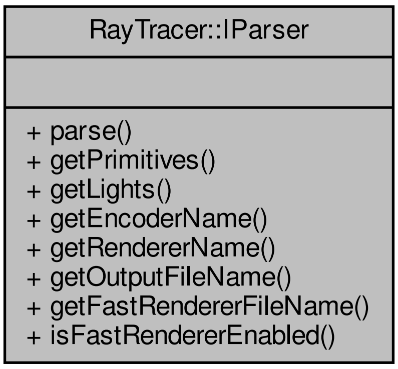
6.18 RayTracer::IParser Class Reference

```
#include <IParser.hpp>
```

Inheritance diagram for RayTracer::IParser:



Collaboration diagram for RayTracer::IParser:



Public Member Functions

- virtual void parse (RayTracer::Camera &cam)=0

    Parse the scene and fill the Camera object.
- virtual std::vector< std::unique_ptr< RayTracer::IPrimitives > > & getPrimitives ()=0

    Get a vector of unique pointers to the scene primitives.
- virtual std::vector< std::unique_ptr< RayTracer::ILight > > & getLights ()=0

    Get a vector of unique pointers to the scene lights.
- virtual std::string getEncoderName () const =0

    Get the name of the encoder.
- virtual std::string getRendererName () const =0

    Get the name of the renderer.
- virtual std::string getOutputFileName () const =0

    Get the name of the output file.
- virtual std::string getFastRendererFileName () const =0
- virtual bool isFastRendererEnabled () const =0

6.18.1 Member Function Documentation

6.18.1.1 getEncoderName()

```
virtual std::string RayTracer::IParser::getEncoderName ( ) const  [pure virtual]
```

Get the name of the encoder.

Returns

std::string The name of the encoder

Implemented in RayTracer::Parser.

6.18.1.2 getFastRendererFileName()

```
virtual std::string RayTracer::IParser::getFastRendererFileName ( ) const  [pure virtual]
```

Implemented in RayTracer::Parser.

6.18.1.3 getLights()

```
virtual std::vector<std::unique_ptr<RayTracer::ILight> >& RayTracer::IParser::getLights ( )
[pure virtual]
```

Get a vector of unique pointers to the scene lights.

Returns

std::vector<std::unique_ptr<RayTracer::ILight>>& Vector of unique pointers to the scene lights

Implemented in RayTracer::Parser.

6.18.1.4 getOutputFileName()

```
virtual std::string RayTracer::IParser::getOutputFileName ( ) const  [pure virtual]
```

Get the name of the output file.

Returns

std::string The name of the output file

Implemented in RayTracer::Parser.

6.18.1.5 getPrimitives()

```
virtual std::vector<std::unique_ptr<RayTracer::IPrimitives> >& RayTracer::IParser::get←
Primitives ( )  [pure virtual]
```

Get a vector of unique pointers to the scene primitives.

Returns

std::vector<std::unique_ptr<RayTracer::IPrimitives>>& Vector of unique pointers to the scene primitives

Implemented in RayTracer::Parser.

6.18.1.6 getRendererName()

```
virtual std::string RayTracer::IParser::getRendererName ( ) const  [pure virtual]
```

Get the name of the renderer.

Returns

std::string The name of the renderer

Implemented in RayTracer::Parser.

6.18.1.7 isFastRendererEnabled()

```
virtual bool RayTracer::IParser::isFastRendererEnabled ( ) const  [pure virtual]
```

Implemented in RayTracer::Parser.

6.18.1.8 parse()

```
virtual void RayTracer::IParser::parse (
             RayTracer::Camera & cam )  [pure virtual]
```

Parse the scene and fill the Camera object.

Parameters

cam	The Camera object to be filled

Implemented in RayTracer::Parser.

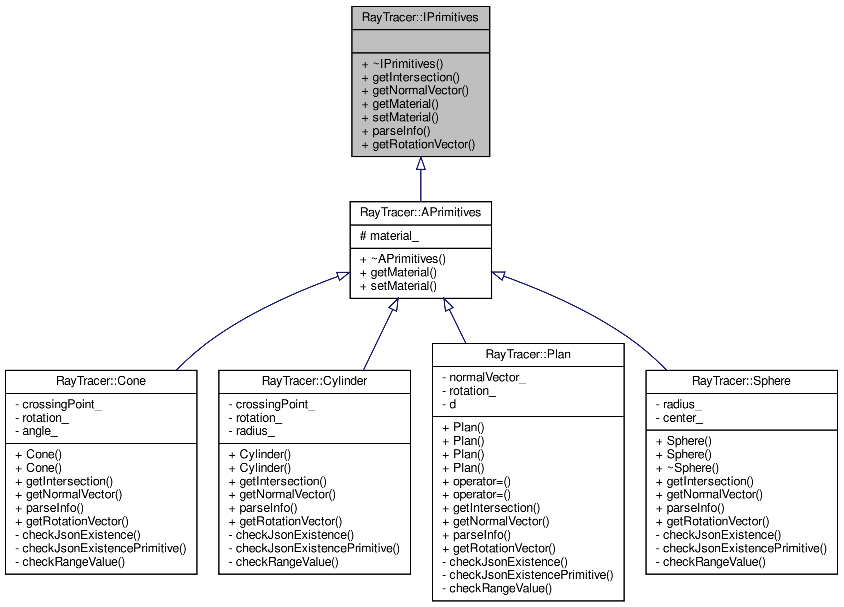
The documentation for this class was generated from the following file:

- include/parser/IParser.hpp

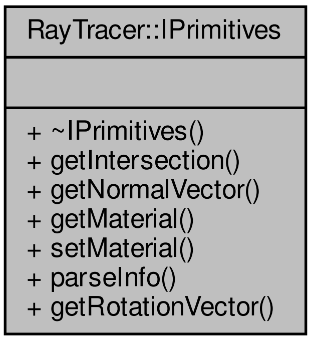
6.19 RayTracer::IPrimitives Class Reference

```
#include <IPrimitives.hpp>
```

Inheritance diagram for RayTracer::IPrimitives:



Collaboration diagram for RayTracer::IPrimitives:



Public Member Functions

- virtual ~IPrimitives ()=default
- virtual std::vector< double > getIntersection (RayTracer::Ray ray)=0
- virtual Math::Vector3D getNormalVector (Math::Point3D point)=0
- virtual Material getMaterial ()=0
- virtual void setMaterial (Color color, double reflect, int specular, double transparency)=0
- virtual void parseInfo (json object)=0
- virtual Math::Vector3D getRotationVector ()=0

6.19.1 Constructor & Destructor Documentation

6.19.1.1 ∼IPrimitives()

```
virtual RayTracer::IPrimitives::∼IPrimitives ( )  [virtual], [default]
```

6.19.2 Member Function Documentation

6.19.2.1 getIntersection()

```
virtual std::vector<double> RayTracer::IPrimitives::getIntersection (
            RayTracer::Ray ray )  [pure virtual]
```

Implemented in RayTracer::Cone, RayTracer::Sphere, RayTracer::Plan, and RayTracer::Cylinder.

6.19.2.2 getMaterial()

```
virtual Material RayTracer::IPrimitives::getMaterial ( )  [pure virtual]
```

Implemented in RayTracer::APrimitives.

6.19.2.3 getNormalVector()

```
virtual Math::Vector3D RayTracer::IPrimitives::getNormalVector (
            Math::Point3D point )  [pure virtual]
```

Implemented in RayTracer::Sphere, RayTracer::Plan, RayTracer::Cylinder, and RayTracer::Cone.

6.19.2.4 getRotationVector()

```
virtual Math::Vector3D RayTracer::IPrimitives::getRotationVector ( )  [pure virtual]
```

Implemented in RayTracer::Sphere, RayTracer::Plan, RayTracer::Cylinder, and RayTracer::Cone.

6.19.2.5 parseInfo()

```
virtual void RayTracer::IPrimitives::parseInfo (
            json object )  [pure virtual]
```

Implemented in RayTracer::Sphere, RayTracer::Plan, RayTracer::Cylinder, and RayTracer::Cone.

6.19.2.6 setMaterial()

```
virtual void RayTracer::IPrimitives::setMaterial (
            Color color,
            double reflect,
            int specular,
            double transparency )  [pure virtual]
```

Implemented in RayTracer::APrimitives.

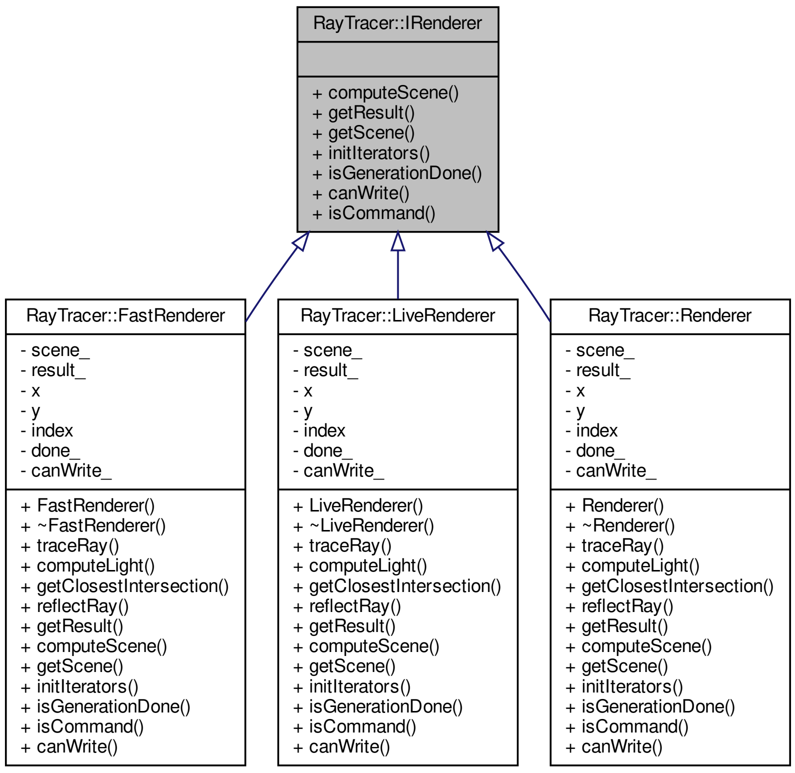
The documentation for this class was generated from the following file:

- include/primitives/IPrimitives.hpp

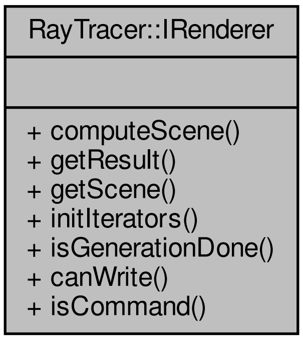
6.20 RayTracer::IRenderer Class Reference

```
#include <IRenderer.hpp>
```

Inheritance diagram for RayTracer::IRenderer:



Collaboration diagram for RayTracer::IRenderer:



Public Member Functions

- virtual void computeScene ()=0

  Compute the scene and render the result.
- virtual std::vector< std::vector< Color > > getResult ()=0

  Get the result of the rendering as a 2D vector of colors.
- virtual Scene & getScene ()=0

  Get the scene used for rendering.
- virtual void initIterators ()=0

  Initializes the iterators for generation.
- virtual bool isGenerationDone ()=0

  Checks if the generation process is done.
- virtual bool canWrite ()=0

  Checks if writing is allowed.
- virtual bool isCommand ()=0

  Checks if the current action is a command.

6.20.1 Member Function Documentation

6.20.1.1 canWrite()

```
virtual bool RayTracer::IRenderer::canWrite ( )  [pure virtual]
```

Checks if writing is allowed.

Returns

True if writing is allowed, False otherwise

Implemented in RayTracer::LiveRenderer, RayTracer::FastRenderer, and RayTracer::Renderer.

6.20.1.2 computeScene()

```
virtual void RayTracer::IRenderer::computeScene ( )  [pure virtual]
```

Compute the scene and render the result.

Implemented in RayTracer::LiveRenderer, RayTracer::FastRenderer, and RayTracer::Renderer.

6.20.1.3 getResult()

```
virtual std::vector<std::vector<Color> > RayTracer::IRenderer::getResult ( )  [pure virtual]
```

Get the result of the rendering as a 2D vector of colors.

Returns

The result of the rendering as a 2D vector of colors.

Implemented in RayTracer::LiveRenderer, RayTracer::FastRenderer, and RayTracer::Renderer.

6.20.1.4 getScene()

```
virtual Scene& RayTracer::IRenderer::getScene ( )  [pure virtual]
```

Get the scene used for rendering.

Returns

The scene used for rendering.

Implemented in RayTracer::LiveRenderer, RayTracer::FastRenderer, and RayTracer::Renderer.

6.20.1.5 initIterators()

```
virtual void RayTracer::IRenderer::initIterators ( )  [pure virtual]
```

Initializes the iterators for generation.

Implemented in RayTracer::LiveRenderer, RayTracer::FastRenderer, and RayTracer::Renderer.

6.20.1.6 isCommand()

```
virtual bool RayTracer::IRenderer::isCommand ( )  [pure virtual]
```

Checks if the current action is a command.

Returns

True if the current action is a command, False otherwise

Implemented in RayTracer::LiveRenderer, RayTracer::FastRenderer, and RayTracer::Renderer.

6.20.1.7 isGenerationDone()

```
virtual bool RayTracer::IRenderer::isGenerationDone ( )  [pure virtual]
```

Checks if the generation process is done.

Returns

True if the generation is done, False otherwise

Implemented in RayTracer::LiveRenderer, RayTracer::FastRenderer, and RayTracer::Renderer.

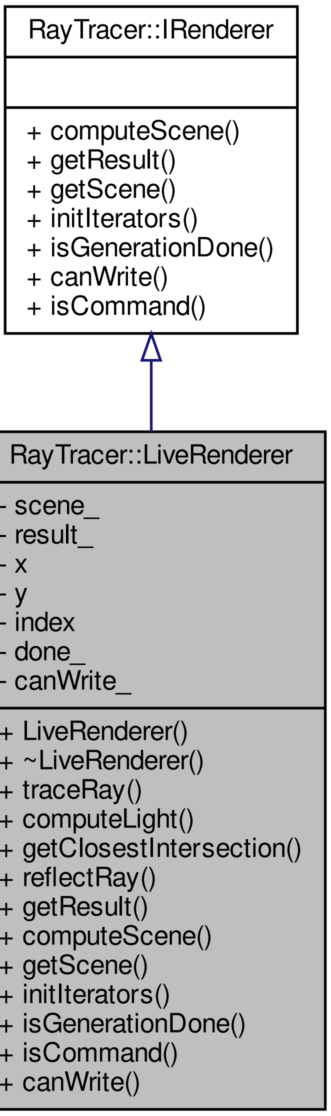
The documentation for this class was generated from the following file:

- include/renderer/IRenderer.hpp

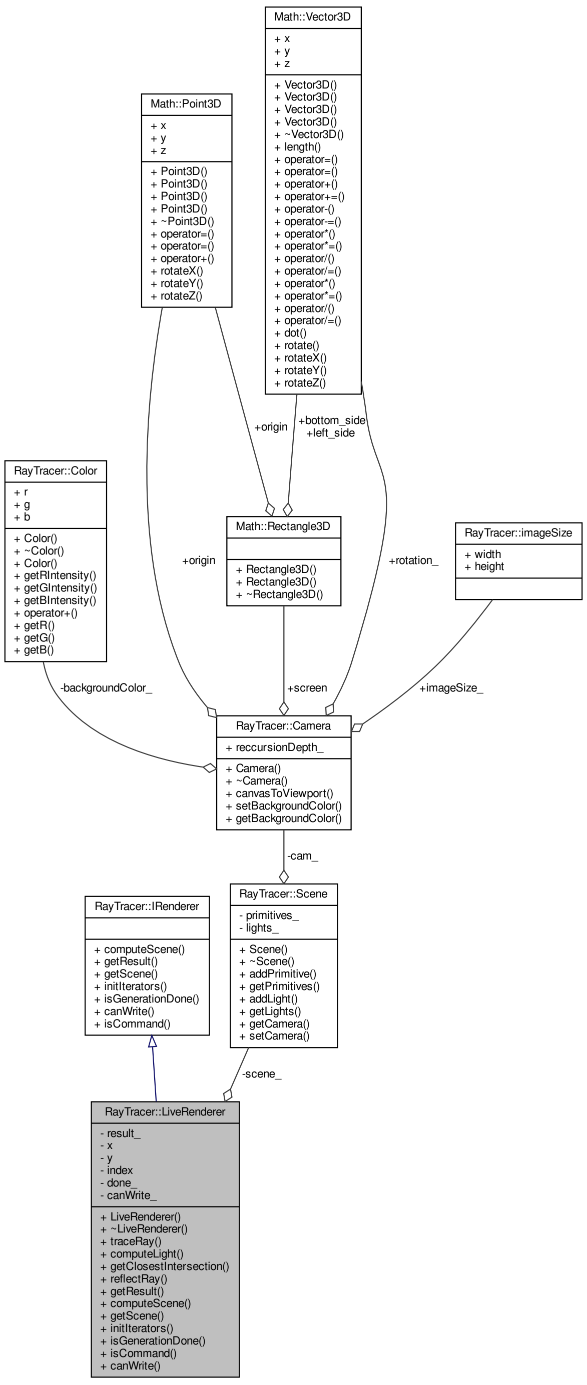
6.21 RayTracer::LiveRenderer Class Reference

```
#include <Renderer.hpp>
```

Inheritance diagram for RayTracer::LiveRenderer:



Collaboration diagram for RayTracer::LiveRenderer:



Public Member Functions

- LiveRenderer ()=default
- ∼LiveRenderer ()=default
- Color traceRay (RayTracer::Ray ray, double tMin, double tMax, int recursion_depth)
- Color computeLight (Math::Point3D intersectionPoint, Math::Vector3D normalVector, Math::Vector3D rayDir, int spec)

- intersection getClosestIntersection (RayTracer::Ray ray, double tMin, double tMax)
- Math::Vector3D reflectRay (Math::Vector3D normalVector, Math::Vector3D ray)
- std::vector< std::vector< Color > > getResult () override

  Get the result of the rendering as a 2D vector of colors.
- void computeScene () override

  Compute the scene and render the result.
- Scene & getScene () override

  Get the scene used for rendering.
- void initIterators () override

  Initializes the iterators for generation.
- bool isGenerationDone () override

  Checks if the generation process is done.
- bool isCommand () override

  Checks if the current action is a command.
- bool canWrite () override

  Checks if writing is allowed.

Private Attributes

- Scene scene_ {}
- std::vector< std::vector< Color > > result_
- double x
- double y
- std::size_t index = 0
- bool done_ { false }
- bool canWrite_ { false }

6.21.1 Constructor & Destructor Documentation

6.21.1.1 LiveRenderer()

```
RayTracer::LiveRenderer::LiveRenderer ( )  [default]
```

6.21.1.2 ∼LiveRenderer()

```
RayTracer::LiveRenderer::∼LiveRenderer ( )  [default]
```

6.21.2 Member Function Documentation

6.21.2.1 canWrite()

```
bool RayTracer::LiveRenderer::canWrite ( )  [override], [virtual]
```

Checks if writing is allowed.

Returns

True if writing is allowed, False otherwise

Implements RayTracer::IRenderer.

6.21.2.2 computeLight()

```
Color RayTracer::LiveRenderer::computeLight (
            Math::Point3D intersectionPoint,
            Math::Vector3D normalVector,
            Math::Vector3D rayDir,
            int spec )
```

6.21.2.3 computeScene()

```
void RayTracer::LiveRenderer::computeScene ( )  [override], [virtual]
```

Compute the scene and render the result.

Implements RayTracer::IRenderer.

6.21.2.4 getClosestIntersection()

```
intersection RayTracer::LiveRenderer::getClosestIntersection (
            RayTracer::Ray ray,
            double tMin,
            double tMax )
```

6.21.2.5 getResult()

```
std::vector< std::vector< Color > > RayTracer::LiveRenderer::getResult ( )  [override], [virtual]
```

Get the result of the rendering as a 2D vector of colors.

Returns

The result of the rendering as a 2D vector of colors.

Implements RayTracer::IRenderer.

6.21.2.6 getScene()

```
Scene & RayTracer::LiveRenderer::getScene ( )  [override], [virtual]
```

Get the scene used for rendering.

Returns

The scene used for rendering.

Implements RayTracer::IRenderer.

6.21.2.7 initIterators()

```
void RayTracer::LiveRenderer::initIterators ( )  [override], [virtual]
```

Initializes the iterators for generation.

Implements RayTracer::IRenderer.

6.21.2.8 isCommand()

```
bool RayTracer::LiveRenderer::isCommand ( )  [override], [virtual]
```

Checks if the current action is a command.

Returns

True if the current action is a command, False otherwise

Implements RayTracer::IRenderer.

6.21.2.9 isGenerationDone()

```
bool RayTracer::LiveRenderer::isGenerationDone ( )  [override], [virtual]
```

Checks if the generation process is done.

Returns

True if the generation is done, False otherwise

Implements RayTracer::IRenderer.

6.21.2.10 reflectRay()

```
Math::Vector3D RayTracer::LiveRenderer::reflectRay (
            Math::Vector3D normalVector,
            Math::Vector3D ray )
```

6.21.2.11 traceRay()

```
Color RayTracer::LiveRenderer::traceRay (
            RayTracer::Ray ray,
            double tMin,
            double tMax,
            int recursion_depth )
```

6.21.3 Field Documentation

6.21.3.1 canWrite_

```
bool RayTracer::LiveRenderer::canWrite_ { false }  [private]
```

6.21.3.2 done_

```
bool RayTracer::LiveRenderer::done_ { false }  [private]
```

6.21.3.3 index

```
std::size_t RayTracer::LiveRenderer::index = 0  [private]
```

6.21.3.4 result_

```
std::vector<std::vector<Color> > RayTracer::LiveRenderer::result_  [private]
```

6.21.3.5 scene_

```
Scene RayTracer::LiveRenderer::scene_ {} [private]
```

6.21.3.6 x

```
double RayTracer::LiveRenderer::x [private]
```

6.21.3.7 y

```
double RayTracer::LiveRenderer::y [private]
```

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

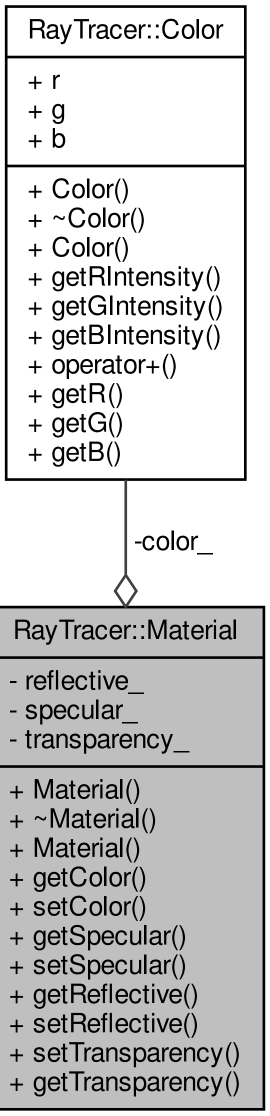
- src/plugins/renderer/liveRenderer/Renderer.hpp
- src/plugins/renderer/liveRenderer/Renderer.cpp

6.22 RayTracer::Material Class Reference

Material class representing the properties of a surface of an object.

```
#include <Material.hpp>
```

Collaboration diagram for RayTracer::Material:



Public Member Functions

- Material ()=default
- ~Material ()=default
- Material (double reflect, int specular, Color color, double transparency)

  Construct a new Material object.
- Color getColor () const

  Get the color of the material.
- void setColor (double r, double g, double b)

  Set the color of the material.
- int getSpecular () const

  Get the specular exponent of the material.
- void setSpecular (int spec)

  Set the specular exponent of the material.
- double getReflective () const

  Get the reflection coefficient of the material.
- void setReflective (double reflect)

  Set the reflection coefficient of the material.
- void setTransparency (double transparency)

  Set the transparency of the material.
- double getTransparency ()

  Get the transparency of the material.

Private Attributes

- double reflective_ {0}
- int specular_ {-1}
- Color color_ {0, 0, 0}
- double transparency_ {0}

6.22.1 Detailed Description

Material class representing the properties of a surface of an object.

6.22.2 Constructor & Destructor Documentation

6.22.2.1 Material() [1/2]

```
RayTracer::Material::Material ( )  [default]
```

6.22.2.2 ∼Material()

```
RayTracer::Material::∼Material ( )  [default]
```

6.22.2.3 Material() [2/2]

```
RayTracer::Material::Material (
              double reflect,
              int specular,
              Color color,
              double transparency )
```

Construct a new Material object.

Parameters

reflect	the reflection coefficient of the material
specular	the specular exponent of the material
color	the color of the material
transparency	the transparency of the material

6.22.3 Member Function Documentation

6.22.3.1 getColor()

```
RayTracer::Color RayTracer::Material::getColor ( ) const
```

Get the color of the material.

Returns

the color of the material

6.22.3.2 getReflective()

```
double RayTracer::Material::getReflective ( ) const
```

Get the reflection coefficient of the material.

Returns

the reflection coefficient of the material

6.22.3.3 getSpecular()

```
int RayTracer::Material::getSpecular ( ) const
```

Get the specular exponent of the material.

Returns

the specular exponent of the material

6.22.3.4 getTransparency()

```
double RayTracer::Material::getTransparency ( )
```

Get the transparency of the material.

Returns

the transparency of the material

6.22.3.5 setColor()

```
void RayTracer::Material::setColor (
             double r,
             double g,
             double b )
```

Set the color of the material.

Parameters

r	the red component of the color
g	the green component of the color
b	the blue component of the color

6.22.3.6 setReflective()

```
void RayTracer::Material::setReflective (
             double reflect )
```

Set the reflection coefficient of the material.

Parameters

reflect	the reflection coefficient to be set

6.22.3.7 setSpecular()

```
void RayTracer::Material::setSpecular (
             int spec )
```

Set the specular exponent of the material.

Parameters

spec	the specular exponent to be set

6.22.3.8 setTransparency()

```
void RayTracer::Material::setTransparency (
             double transparency )
```

Set the transparency of the material.

Parameters

transparency	the transparency to be set

6.22.4 Field Documentation

6.22.4.1 color_

```
Color RayTracer::Material::color_ {0, 0, 0}  [private]
```

6.22.4.2 reflective_

```
double RayTracer::Material::reflective_ {0}  [private]
```

6.22.4.3 specular_

```
int RayTracer::Material::specular_ {-1}  [private]
```

6.22.4.4 transparency_

```
double RayTracer::Material::transparency_ {0}  [private]
```

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

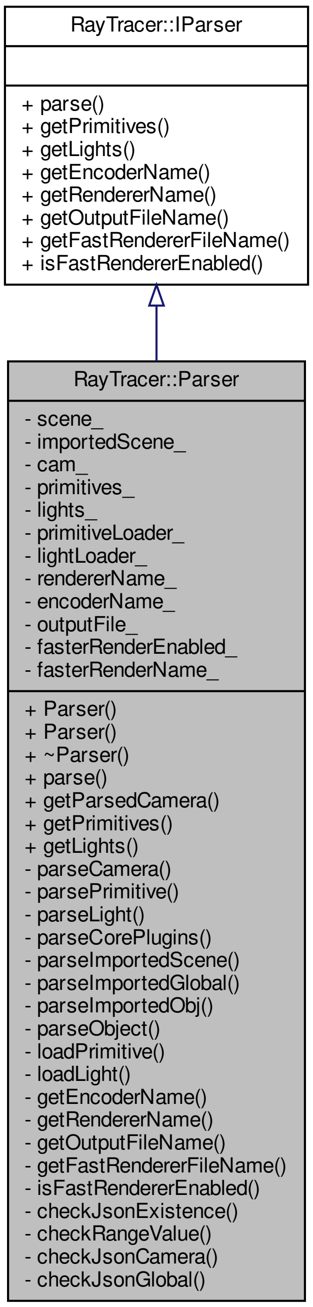
- include/material/Material.hpp
- src/utils/Material.cpp

6.23 RayTracer::Parser Class Reference

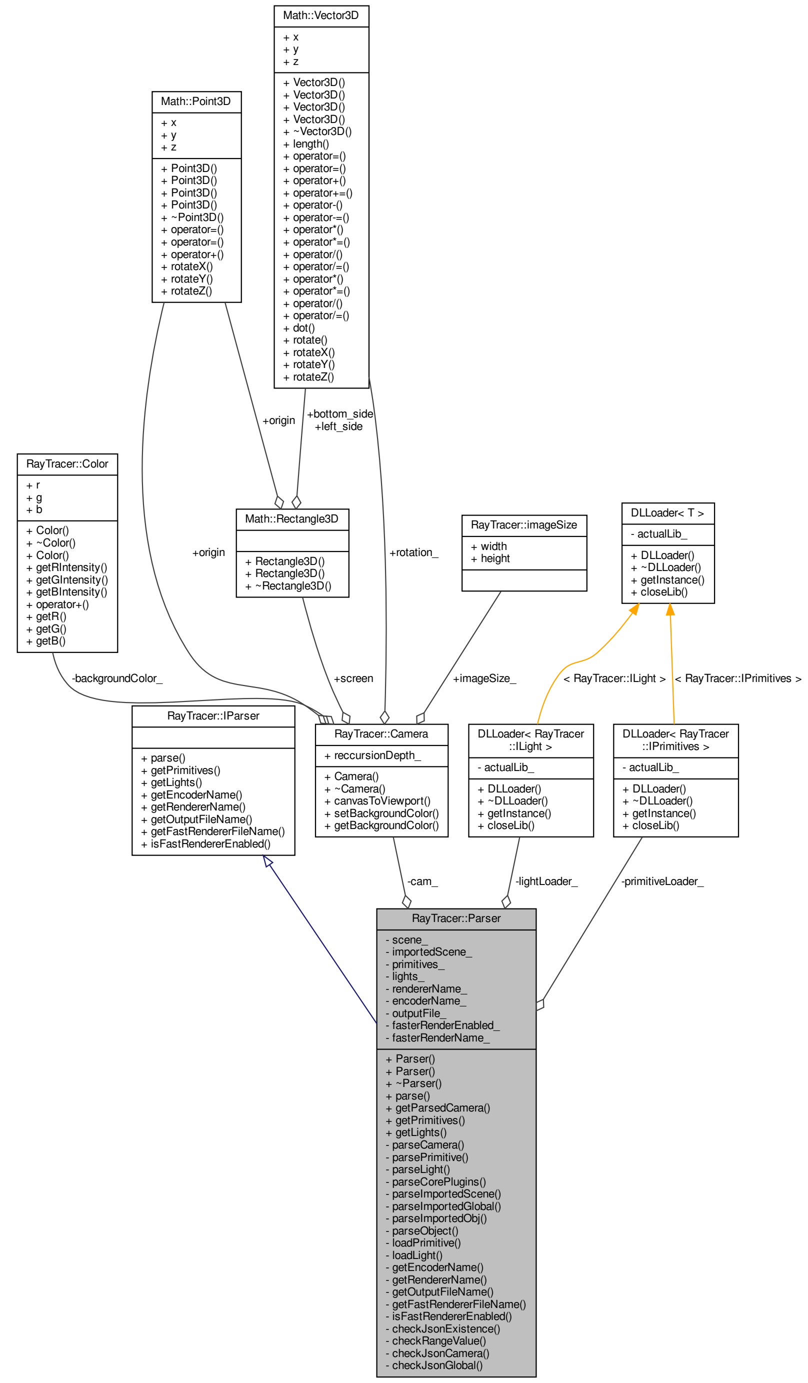
Class for the parser.

```
#include <Parser.hpp>
```

Inheritance diagram for RayTracer::Parser:



Collaboration diagram for RayTracer::Parser:



Public Member Functions

- Parser ()=default
- Parser (const std::string &path)
- ∼Parser ()=default
- void parse (RayTracer::Camera &cam) final

    Parses the scene file and extracts the camera information.

- RayTracer::Camera getParsedCamera ()

    Returns the parsed camera object.
- std::vector< std::unique_ptr< RayTracer::IPrimitives > > & getPrimitives () final

    Returns a reference to the vector of parsed primitives.
- std::vector< std::unique_ptr< RayTracer::ILight > > & getLights () final

    Returns a reference to the vector of parsed lights.

Private Member Functions

- void parseCamera (RayTracer::Camera &cam)

    Parses the camera information from the scene file.
- void parsePrimitive ()

    Parses primitive objects from the scene file.
- void parseLight ()

    Parses light objects from the scene file.
- void parseCorePlugins ()

    Parses the core plugins from the scene file.
- void parseImportedScene ()

    Parses elements from the imported scene.
- void parseImportedGlobal ()

    Parses the "global" element from the imported scene.
- void parseImportedObj (const std::string &name)

    Parses objects from the imported scene.
- void parseObject (const std::string &name, json object, const std::string &key)

    Parses a nested object from the imported scene.
- std::unique_ptr< IPrimitives > loadPrimitive (const std::string &key)

    Loads a primitive object based on the given key.
- std::unique_ptr< ILight > loadLight (const std::string &key)

    Loads a light object based on the given key.
- std::string getEncoderName () const final

    Gets the name of the encoder.
- std::string getRendererName () const final

    Gets the name of the renderer.
- std::string getOutputFileName () const final

    Gets the name of the output file.
- std::string getFastRendererFileName () const final

    Gets the name of the fast renderer.
- bool isFastRendererEnabled () const final

    Checks if the fast renderer is enabled.
- void checkJsonExistence (const json &scene, const std::string &field_name)

    Checks if the given key exists in the scene file.
- void checkRangeValue (const json &scene, const std::string &field_name, const std::string &comparison_↩
sign, double value)

    Checks if the value of the given key is within the specified range.
- void checkJsonCamera (json scene)

    Checks if the camera exists in the scene file.
- void checkJsonGlobal (json scene)

    Checks if the global exist in the scene file.

Private Attributes

- json scene_ {}
- json importedScene_ {}
- RayTracer::Camera cam_
- std::vector< std::unique_ptr< RayTracer::IPrimitives > > primitives_
- std::vector< std::unique_ptr< RayTracer::ILight > > lights_
- DLLoader< IPrimitives > primitiveLoader_
- DLLoader< ILight > lightLoader_
- std::string rendererName_
- std::string encoderName_
- std::string outputFile_
- bool fasterRenderEnabled_ { false }
- std::string fasterRenderName_

6.23.1 Detailed Description

Class for the parser.

6.23.2 Constructor & Destructor Documentation

6.23.2.1 Parser() [1/2]

```
RayTracer::Parser::Parser ( )  [default]
```

6.23.2.2 Parser() [2/2]

```
RayTracer::Parser::Parser (
            const std::string & path )  [explicit]
```

6.23.2.3 ∼Parser()

```
RayTracer::Parser::∼Parser ( )  [default]
```

6.23.3 Member Function Documentation

6.23.3.1 checkJsonCamera()

```
void RayTracer::Parser::checkJsonCamera (
            json scene )  [private]
```

Checks if the camera exists in the scene file.

Parameters

scene	the scene file

6.23.3.2 checkJsonExistence()

```
void RayTracer::Parser::checkJsonExistence (
            const json & scene,
            const std::string & field_name )  [private]
```

Checks if the given key exists in the scene file.

Parameters

scene	the scene file
field_name	the key to check

6.23.3.3 checkJsonGlobal()

```
void RayTracer::Parser::checkJsonGlobal (
            json scene )  [private]
```

Checks if the global exist in the scene file.

Parameters

scene	the scene file

6.23.3.4 checkRangeValue()

```
void RayTracer::Parser::checkRangeValue (
            const json & scene,
            const std::string & field_name,
            const std::string & comparison_sign,
            double value )  [private]
```

Checks if the value of the given key is within the specified range.

Parameters

scene	the scene file
field_name	the key to check
comparison_sign	the comparison sign
value	the value to compare with

6.23.3.5 getEncoderName()

```
std::string RayTracer::Parser::getEncoderName ( ) const  [final], [private], [virtual]
```

Gets the name of the encoder.

Returns

the name of the encoder

Implements RayTracer::IParser.

6.23.3.6 getFastRendererFileName()

```
std::string RayTracer::Parser::getFastRendererFileName ( ) const  [final], [private], [virtual]
```

Gets the name of the fast renderer.

Returns

the name of the fast renderer

Implements RayTracer::IParser.

6.23.3.7 getLights()

```
std::vector< std::unique_ptr< RayTracer::ILight > > & RayTracer::Parser::getLights ( )  [final],
[virtual]
```

Returns a reference to the vector of parsed lights.

Returns

the vector of parsed lights

Implements RayTracer::IParser.

6.23.3.8 getOutputFileName()

```
std::string RayTracer::Parser::getOutputFileName ( ) const  [final], [private], [virtual]
```

Gets the name of the output file.

Returns

the name of the output file

Implements RayTracer::IParser.

6.23.3.9 getParsedCamera()

```
RayTracer::Camera RayTracer::Parser::getParsedCamera ( )
```

Returns the parsed camera object.

Returns

the parsed camera object

6.23.3.10 getPrimitives()

```
std::vector< std::unique_ptr< RayTracer::IPrimitives > > & RayTracer::Parser::getPrimitives (
)  [final], [virtual]
```

Returns a reference to the vector of parsed primitives.

Returns

the vector of parsed primitives

Implements RayTracer::IParser.

6.23.3.11 getRendererName()

```
std::string RayTracer::Parser::getRendererName ( ) const  [final], [private], [virtual]
```

Gets the name of the renderer.

Returns

the name of the renderer

Implements RayTracer::IParser.

6.23.3.12 isFastRendererEnabled()

```
bool RayTracer::Parser::isFastRendererEnabled ( ) const  [final], [private], [virtual]
```

Checks if the fast renderer is enabled.

Returns

true if the fast renderer is enabled, false otherwise

Implements RayTracer::IParser.

6.23.3.13 loadLight()

```
std::unique_ptr< ILight > RayTracer::Parser::loadLight (
             const std::string & key )  [private]
```

Loads a light object based on the given key.

Parameters

key	the key for the light object

Returns

a unique pointer to the parsed light object

6.23.3.14 loadPrimitive()

```
std::unique_ptr< IPrimitives > RayTracer::Parser::loadPrimitive (
             const std::string & key )  [private]
```

Loads a primitive object based on the given key.

Parameters

key	the key for the primitive object

Returns

a unique pointer to the parsed primitive object

6.23.3.15 parse()

```
void RayTracer::Parser::parse (
            RayTracer::Camera & cam ) [final], [virtual]
```

Parses the scene file and extracts the camera information.

Parameters

cam	the camera object to store the parsed data

Implements RayTracer::IParser.

6.23.3.16 parseCamera()

```
void RayTracer::Parser::parseCamera (
            RayTracer::Camera & cam ) [private]
```

Parses the camera information from the scene file.

Parameters

cam	the camera object to store the parsed data

6.23.3.17 parseCorePlugins()

```
void RayTracer::Parser::parseCorePlugins ( ) [private]
```

Parses the core plugins from the scene file.

6.23.3.18 parseImportedGlobal()

```
void RayTracer::Parser::parseImportedGlobal ( ) [private]
```

Parses the "global" element from the imported scene.

6.23.3.19 parseImportedObj()

```
void RayTracer::Parser::parseImportedObj (
            const std::string & name ) [private]
```

Parses objects from the imported scene.

Parameters

name	the name of the object

6.23.3.20 parseImportedScene()

```
void RayTracer::Parser::parseImportedScene ( )  [private]
```

Parses elements from the imported scene.

6.23.3.21 parseLight()

```
void RayTracer::Parser::parseLight ( )  [private]
```

Parses light objects from the scene file.

6.23.3.22 parseObject()

```
void RayTracer::Parser::parseObject (
            const std::string & name,
            json object,
            const std::string & key )  [private]
```

Parses a nested object from the imported scene.

Parameters

name	the name of the object
object	the object to parse
key	the key of the object

6.23.3.23 parsePrimitive()

```
void RayTracer::Parser::parsePrimitive ( )  [private]
```

Parses primitive objects from the scene file.

6.23.4 Field Documentation

6.23.4.1 cam_

```
RayTracer::Camera RayTracer::Parser::cam_  [private]
```

6.23.4.2 encoderName_

```
std::string RayTracer::Parser::encoderName_  [private]
```

6.23.4.3 fasterRenderEnabled_

```
bool RayTracer::Parser::fasterRenderEnabled_ { false }  [private]
```

6.23.4.4 fasterRenderName_

```
std::string RayTracer::Parser::fasterRenderName_  [private]
```

6.23.4.5 importedScene_

```
json RayTracer::Parser::importedScene_ {}  [private]
```

6.23.4.6 lightLoader_

```
DLLoader<ILight> RayTracer::Parser::lightLoader_  [private]
```

6.23.4.7 lights_

```
std::vector<std::unique_ptr<RayTracer::ILight> > RayTracer::Parser::lights_  [private]
```

6.23.4.8 outputFile_

```
std::string RayTracer::Parser::outputFile_  [private]
```

6.23.4.9 primitiveLoader_

```
DLLoader<IPrimitives> RayTracer::Parser::primitiveLoader_  [private]
```

6.23.4.10 primitives_

```
std::vector<std::unique_ptr<RayTracer::IPrimitives> > RayTracer::Parser::primitives_  [private]
```

6.23.4.11 rendererName_

```
std::string RayTracer::Parser::rendererName_  [private]
```

6.23.4.12 scene_

```
json RayTracer::Parser::scene_ {}  [private]
```

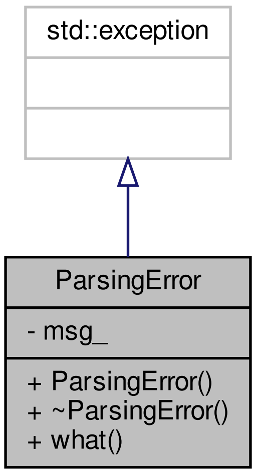
The documentation for this class was generated from the following files:

- include/parser/Parser.hpp
- src/parser/CheckJsonExistence.cpp
- src/parser/ParseImportedScene.cpp
- src/parser/ParseLight.cpp
- src/parser/ParsePrimitive.cpp
- src/parser/Parser.cpp

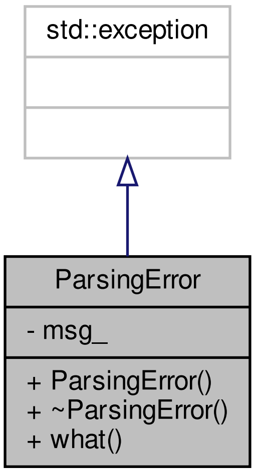
6.24 ParsingError Class Reference

```
#include <Error.hpp>
```

Inheritance diagram for ParsingError:



Collaboration diagram for ParsingError:



Public Member Functions

- ParsingError (const char ∗msg)
- ∼ParsingError () override=default
- const char ∗ what () const noexcept override

Private Attributes

- const char ∗ msg_

6.24.1 Constructor & Destructor Documentation

6.24.1.1 ParsingError()

```
ParsingError::ParsingError (
            const char ∗ msg )
```

6.24.1.2 ∼ParsingError()

```
ParsingError::∼ParsingError ( )  [override], [default]
```

6.24.2 Member Function Documentation

6.24.2.1 what()

```
const char * ParsingError::what ( ) const  [override], [noexcept]
```

6.24.3 Field Documentation

6.24.3.1 msg_

```
const char* ParsingError::msg_  [private]
```

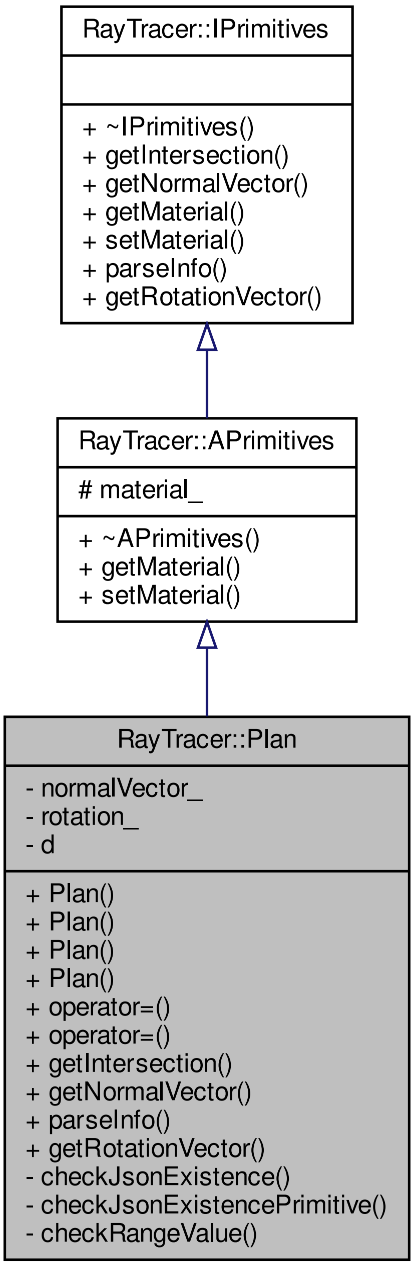
The documentation for this class was generated from the following files:

- include/Error.hpp
- src/parser/Error.cpp

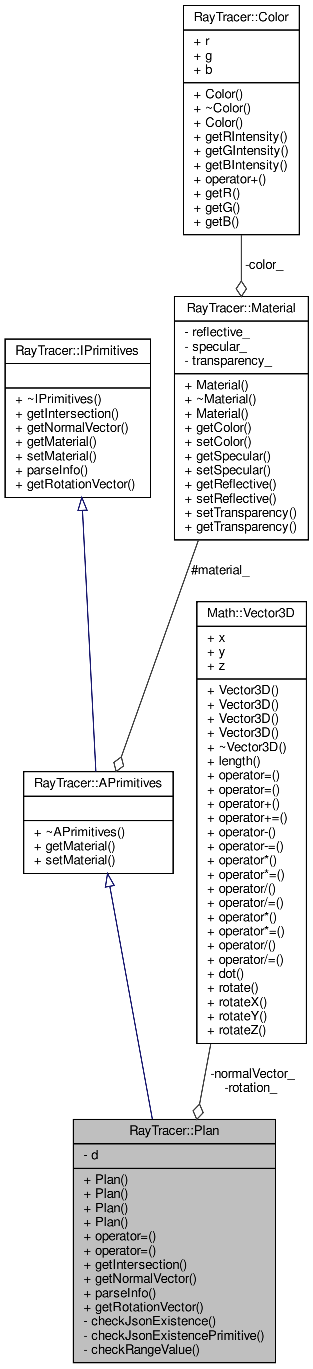
6.25 RayTracer::Plan Class Reference

```
#include <Plan.hpp>
```

Inheritance diagram for RayTracer::Plan:



Collaboration diagram for RayTracer::Plan:



Public Member Functions

- Plan ()=default
- Plan (Math::Vector3D normalVector, double d)
- Plan (Plan &)=default
- Plan (Plan &&)=default
- Plan & operator= (const Plan &)=default

- Plan & operator= (Plan &&)=default
- std::vector< double > getIntersection (RayTracer::Ray ray) final
- Math::Vector3D getNormalVector (Math::Point3D point) final
- void parseInfo (json object) final
- Math::Vector3D getRotationVector ()

Private Member Functions

- void checkJsonExistence (const json &scene, const std::string &field_name)
- void checkJsonExistencePrimitive (const json &scene)
- void checkRangeValue (const json &scene, const std::string &field_name, const std::string &comparison_↩ sign, double value)

Private Attributes

- Math::Vector3D normalVector_
- Math::Vector3D rotation_
- double d

Additional Inherited Members

6.25.1 Constructor & Destructor Documentation

6.25.1.1 Plan() [1/4]

```
RayTracer::Plan::Plan ( )  [default]
```

6.25.1.2 Plan() [2/4]

```
RayTracer::Plan::Plan (
             Math::Vector3D normalVector,
             double d )
```

6.25.1.3 Plan() [3/4]

```
RayTracer::Plan::Plan (
             Plan & )  [default]
```

6.25.1.4 Plan() [4/4]

```
RayTracer::Plan::Plan (
            Plan && ) [default]
```

6.25.2 Member Function Documentation

6.25.2.1 checkJsonExistence()

```
void RayTracer::Plan::checkJsonExistence (
            const json & scene,
            const std::string & field_name ) [private]
```

6.25.2.2 checkJsonExistencePrimitive()

```
void RayTracer::Plan::checkJsonExistencePrimitive (
            const json & scene ) [private]
```

6.25.2.3 checkRangeValue()

```
void RayTracer::Plan::checkRangeValue (
            const json & scene,
            const std::string & field_name,
            const std::string & comparison_sign,
            double value ) [private]
```

6.25.2.4 getIntersection()

```
std::vector< double > RayTracer::Plan::getIntersection (
            RayTracer::Ray ray ) [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.25.2.5 getNormalVector()

```
Math::Vector3D RayTracer::Plan::getNormalVector (
            Math::Point3D point ) [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.25.2.6 getRotationVector()

```
Math::Vector3D RayTracer::Plan::getRotationVector ( )  [virtual]
```

Implements RayTracer::IPrimitives.

6.25.2.7 operator=() [1/2]

```
Plan& RayTracer::Plan::operator= (
            const Plan &  )  [default]
```

6.25.2.8 operator=() [2/2]

```
Plan& RayTracer::Plan::operator= (
            Plan &&  )  [default]
```

6.25.2.9 parseInfo()

```
void RayTracer::Plan::parseInfo (
            json object )  [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.25.3 Field Documentation

6.25.3.1 d

```
double RayTracer::Plan::d  [private]
```

6.25.3.2 normalVector_

```
Math::Vector3D RayTracer::Plan::normalVector_  [private]
```

6.25.3.3 rotation_

```
Math::Vector3D RayTracer::Plan::rotation_  [private]
```

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

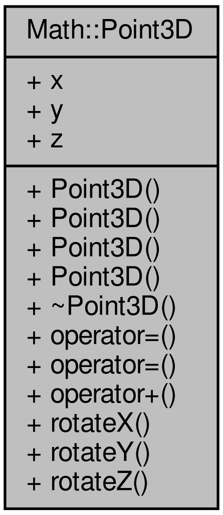
- src/plugins/primitives/plan/Plan.hpp
- src/plugins/primitives/plan/Plan.cpp

6.26 Math::Point3D Class Reference

Class for the 3D point.

```
#include <Point3D.hpp>
```

Collaboration diagram for Math::Point3D:



Public Member Functions

- Point3D ()=default
- Point3D (double x, double y, double z)

  Constructs a point with the given x, y, and z coordinates.
- Point3D (Point3D &)=default

  Copy constructor, constructs a new point by copying the coordinates of the given point.
- Point3D (Point3D &&)=default

  Move constructor, constructs a new point by moving the coordinates of the given point.
- ∼Point3D ()=default
- Point3D & operator= (const Point3D &)=default

Copy assignment operator, assigns the coordinates of the given point to this point.

- Point3D & operator= (Point3D &&)=default

    Move assignment operator, moves the coordinates of the given point to this point.
- Point3D operator+ (const Vector3D &)

    Adds a vector to this point and returns the result as a new point.
- void rotateX (double x)

    Rotate the point on the x axis.
- void rotateY (double y)

    Rotate the point on the y axis.
- void rotateZ (double z)

    Rotate the point on the z axis.

Data Fields

- double x = 0
- double y = 0
- double z = 0

6.26.1 Detailed Description

Class for the 3D point.

6.26.2 Constructor & Destructor Documentation

6.26.2.1 Point3D() [1/4]

```
Math::Point3D::Point3D ( )  [default]
```

6.26.2.2 Point3D() [2/4]

```
Math::Point3D::Point3D (
              double x,
              double y,
              double z )
```

Constructs a point with the given x, y, and z coordinates.

Parameters

x	The x coordinate of the point.
y	The y coordinate of the point.
z	The z coordinate of the point.

6.26.2.3 Point3D() [3/4]

```
Math::Point3D::Point3D (
            Point3D &  )  [default]
```

Copy constructor, constructs a new point by copying the coordinates of the given point.

Parameters

point	The point to copy.

6.26.2.4 Point3D() [4/4]

```
Math::Point3D::Point3D (
            Point3D &&  )  [default]
```

Move constructor, constructs a new point by moving the coordinates of the given point.

Parameters

point	The point to move.

6.26.2.5 ∼Point3D()

```
Math::Point3D::∼Point3D ( )  [default]
```

6.26.3 Member Function Documentation

6.26.3.1 operator+()

```
Point3D Math::Point3D::operator+ (
            const Vector3D & vect )
```

Adds a vector to this point and returns the result as a new point.

Parameters

vect	The vector to add.

Returns

The resulting point after adding the vector.

6.26.3.2 operator=() [1/2]

```
Point3D& Math::Point3D::operator= (
             const Point3D & )  [default]
```

Copy assignment operator, assigns the coordinates of the given point to this point.

Parameters

point	The point to copy.

Returns

A reference to this point.

6.26.3.3 operator=() [2/2]

```
Point3D& Math::Point3D::operator= (
             Point3D && )  [default]
```

Move assignment operator, moves the coordinates of the given point to this point.

Parameters

point	The point to move.

Returns

A reference to this point.

6.26.3.4 rotateX()

```
void Math::Point3D::rotateX (
             double x )
```

Rotate the point on the x axis.

Parameters

x	The x angle in radian

6.26.3.5 rotateY()

```
void Math::Point3D::rotateY (
             double y )
```

Rotate the point on the y axis.

Parameters

y	The y angle in radian

6.26.3.6 rotateZ()

```
void Math::Point3D::rotateZ (
             double z )
```

Rotate the point on the z axis.

Parameters

z	The z angle in radian

6.26.4 Field Documentation

6.26.4.1 x

```
double Math::Point3D::x = 0
```

6.26.4.2 y

```
double Math::Point3D::y = 0
```

6.26.4.3 z

```
double Math::Point3D::z = 0
```

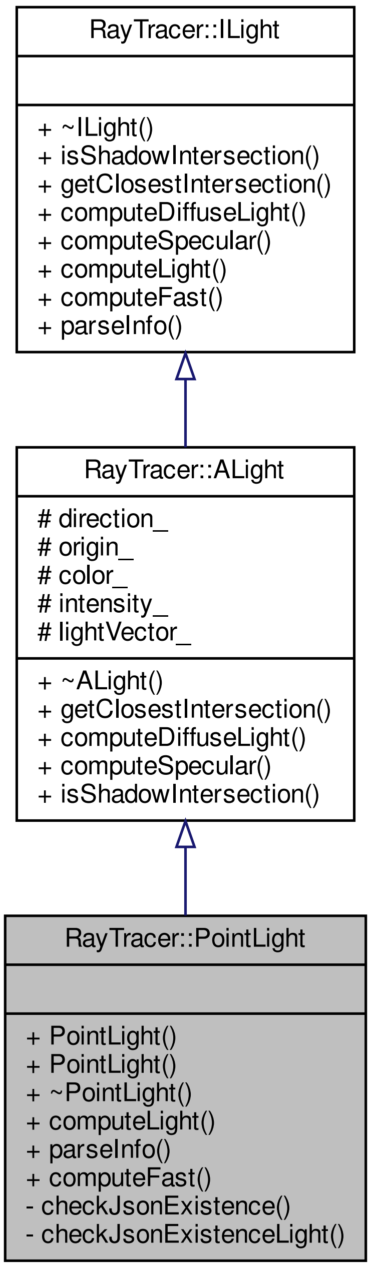
The documentation for this class was generated from the following files:

- include/maths/Point3D.hpp
- src/maths/Point3D.cpp

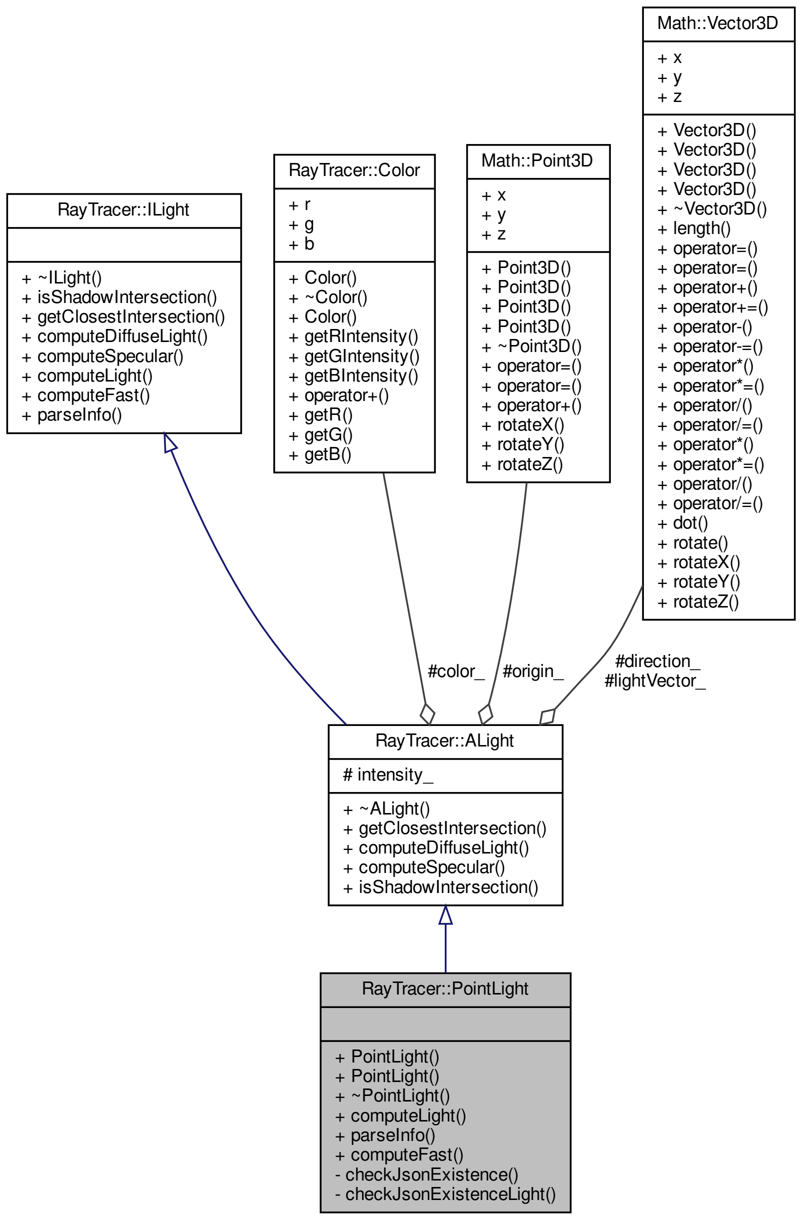
6.27 RayTracer::PointLight Class Reference

```
#include <PointLight.hpp>
```

Inheritance diagram for RayTracer::PointLight:



Collaboration diagram for RayTracer::PointLight:



Public Member Functions

- PointLight (Color color, double intensity, Math::Point3D origin)
- PointLight ()=default
- ∼PointLight () override=default
- Color computeLight (Math::Vector3D normalVector, int spec, Math::Point3D intersectionPoint, Math::Vector3D rayDir, std::vector< std::unique_ptr< IPrimitives >> &primitives) override
- void parseInfo (json object) final

  Information parser to create the light object.
- Color computeFast (Math::Vector3D normalVector, int spec, Math::Point3D intersectionPoint, Math::Vector3D rayDir, std::vector< std::unique_ptr< IPrimitives >> &primitives) final

Private Member Functions

- void checkJsonExistence (const json &scene, const std::string &field_name)
- void checkJsonExistenceLight (const json &scene)

Additional Inherited Members

6.27.1 Constructor & Destructor Documentation

6.27.1.1 PointLight() [1/2]

```
RayTracer::PointLight::PointLight (
            Color color,
            double intensity,
            Math::Point3D origin )
```

6.27.1.2 PointLight() [2/2]

```
RayTracer::PointLight::PointLight ( )  [default]
```

6.27.1.3 ∼PointLight()

```
RayTracer::PointLight::∼PointLight ( )  [override], [default]
```

6.27.2 Member Function Documentation

6.27.2.1 checkJsonExistence()

```
void RayTracer::PointLight::checkJsonExistence (
            const json & scene,
            const std::string & field_name )  [private]
```

6.27.2.2 checkJsonExistenceLight()

```
void RayTracer::PointLight::checkJsonExistenceLight (
             const json & scene )  [private]
```

6.27.2.3 computeFast()

```
Color RayTracer::PointLight::computeFast (
             Math::Vector3D normalVector,
             int spec,
             Math::Point3D intersectionPoint,
             Math::Vector3D rayDir,
             std::vector< std::unique_ptr< IPrimitives >> & primitives )  [final], [virtual]
```

Implements RayTracer::ILight.

6.27.2.4 computeLight()

```
Color RayTracer::PointLight::computeLight (
             Math::Vector3D normalVector,
             int spec,
             Math::Point3D intersectionPoint,
             Math::Vector3D rayDir,
             std::vector< std::unique_ptr< IPrimitives >> & primitives )  [override], [virtual]
```

Implements RayTracer::ILight.

6.27.2.5 parseInfo()

```
void RayTracer::PointLight::parseInfo (
             json object )  [final], [virtual]
```

Information parser to create the light object.

Parameters

object	the json object containing light info

Implements RayTracer::ILight.

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

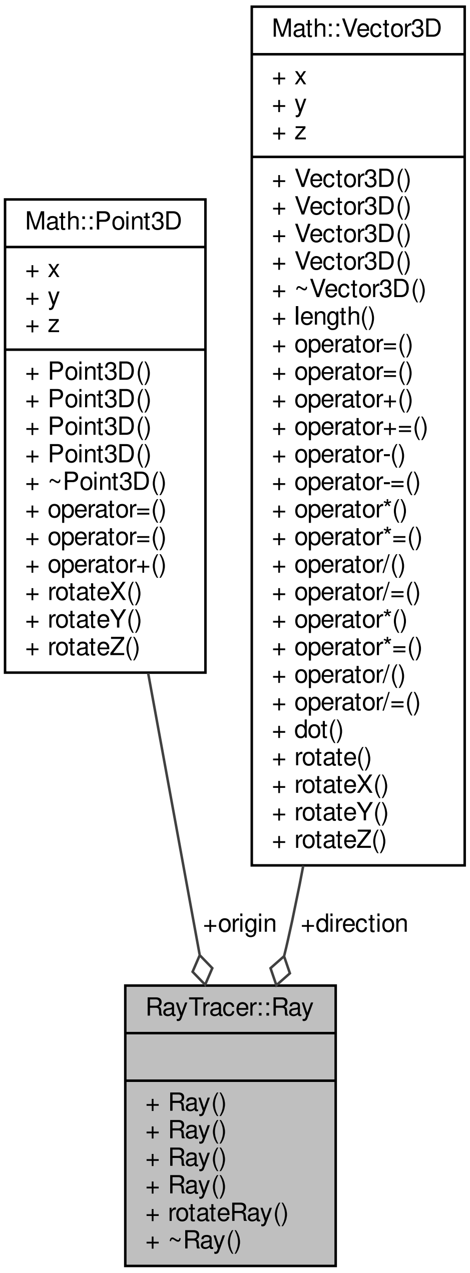
- src/plugins/lights/point/PointLight.hpp
- src/plugins/lights/point/PointLight.cpp

6.28 RayTracer::Ray Class Reference

Class for the ray.

```
#include <Ray.hpp>
```

Collaboration diagram for RayTracer::Ray:



Public Member Functions

- Ray ()=default
- Ray (Math::Point3D, Math::Vector3D)

  Constructs a new 3D ray with the given origin point and direction vector.
- Ray (Ray &)=default

  Constructs a new 3D ray by copying or moving the contents of the given ray.
- Ray (Ray &&)=default

  Constructs a new 3D ray by copying or moving the contents of the given ray.
- void rotateRay (double x, double y, double z)

  Rotate the ray (origin and direction)
- ∼Ray ()=default

Data Fields

- Math::Point3D origin
- Math::Vector3D direction

6.28.1 Detailed Description

Class for the ray.

6.28.2 Constructor & Destructor Documentation

6.28.2.1 Ray() [1/4]

```
RayTracer::Ray::Ray ( )  [default]
```

6.28.2.2 Ray() [2/4]

```
RayTracer::Ray::Ray (
             Math::Point3D origin,
             Math::Vector3D direction )
```

Constructs a new 3D ray with the given origin point and direction vector.

Parameters

origin	The origin point of the ray.
direction	A vector representing the direction of the ray.

6.28.2.3 Ray() [3/4]

```
RayTracer::Ray::Ray (
            Ray & )  [default]
```

Constructs a new 3D ray by copying or moving the contents of the given ray.

Parameters

ray	The ray to copy.

6.28.2.4 Ray() [4/4]

```
RayTracer::Ray::Ray (
            Ray && )  [default]
```

Constructs a new 3D ray by copying or moving the contents of the given ray.

Parameters

ray	The ray to move.

6.28.2.5 ∼Ray()

```
RayTracer::Ray::∼Ray ( )  [default]
```

6.28.3 Member Function Documentation

6.28.3.1 rotateRay()

```
void RayTracer::Ray::rotateRay (
            double x,
            double y,
            double z )
```

Rotate the ray (origin and direction)

Parameters

x	The x angle in radian
y	The y angle in radian
z	The z angle in radian

6.28.4 Field Documentation

6.28.4.1 direction

`Math::Vector3D RayTracer::Ray::direction`

6.28.4.2 origin

`Math::Point3D RayTracer::Ray::origin`

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

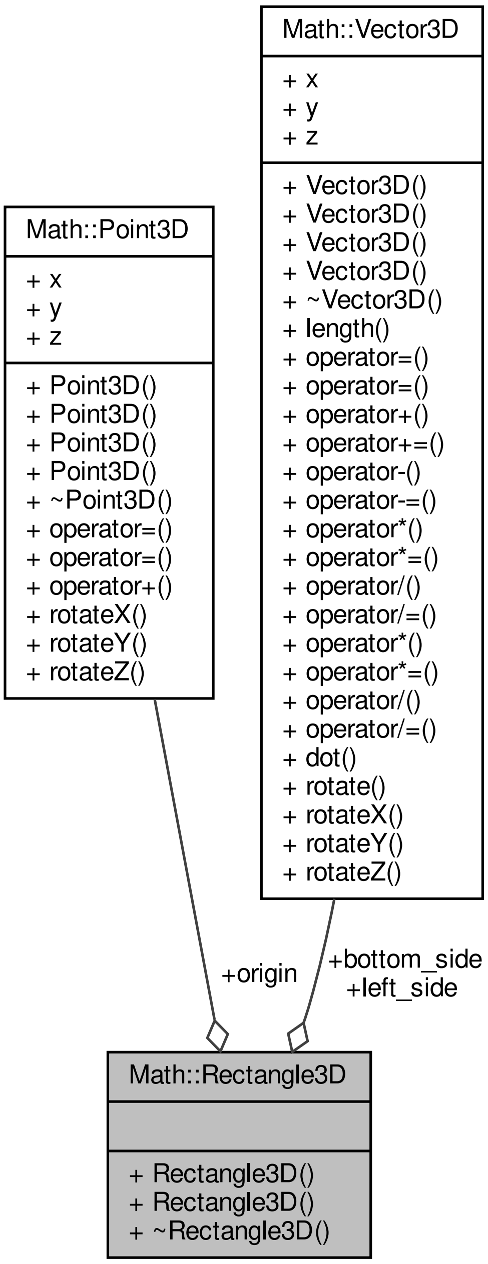
- include/maths/Ray.hpp
- src/maths/Ray.cpp

6.29 Math::Rectangle3D Class Reference

Class for the 3D rectangle.

`#include <Rectangle3D.hpp>`

Collaboration diagram for Math::Rectangle3D:



Public Member Functions

- Rectangle3D ()=default
- Rectangle3D (Math::Point3D origin, Math::Vector3D bottom_side, Math::Vector3D left_side)

  Constructs a new 3D rectangle with the given origin, bottom side vector, and left side vector.
- ∼Rectangle3D ()=default

Data Fields

- Math::Point3D origin
- Math::Vector3D bottom_side
- Math::Vector3D left_side

6.29.1 Detailed Description

Class for the 3D rectangle.

6.29.2 Constructor & Destructor Documentation

6.29.2.1 Rectangle3D() [1/2]

```
Math::Rectangle3D::Rectangle3D ( )  [default]
```

6.29.2.2 Rectangle3D() [2/2]

```
Math::Rectangle3D::Rectangle3D (
             Math::Point3D origin,
             Math::Vector3D bottom_side,
             Math::Vector3D left_side )
```

Constructs a new 3D rectangle with the given origin, bottom side vector, and left side vector.

Parameters

origin	The origin point of the rectangle.
bottom_side	A vector representing the length and direction of the bottom side of the rectangle.
left_side	A vector representing the length and direction of the left side of the rectangle.

6.29.2.3 ∼Rectangle3D()

```
Math::Rectangle3D::∼Rectangle3D ( )  [default]
```

6.29.3 Field Documentation

6.29.3.1 bottom_side

```
Math::Vector3D Math::Rectangle3D::bottom_side
```

6.29.3.2 left_side

```
Math::Vector3D Math::Rectangle3D::left_side
```

6.29.3.3 origin

```
Math::Point3D Math::Rectangle3D::origin
```

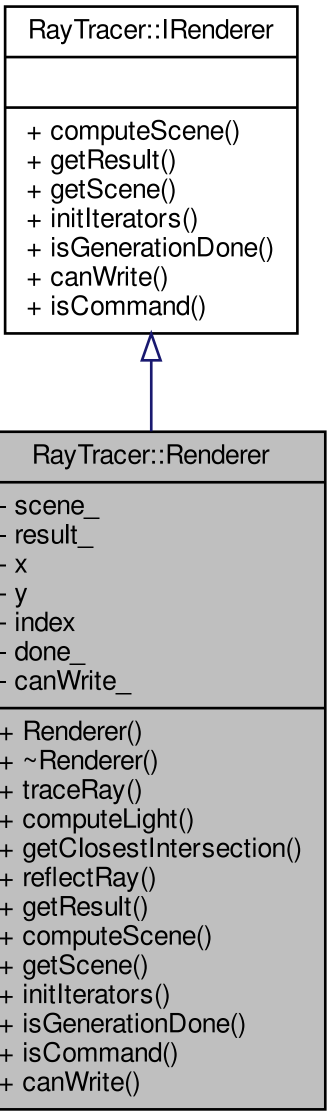
The documentation for this class was generated from the following files:

- include/maths/Rectangle3D.hpp
- src/maths/Rectangle3D.cpp

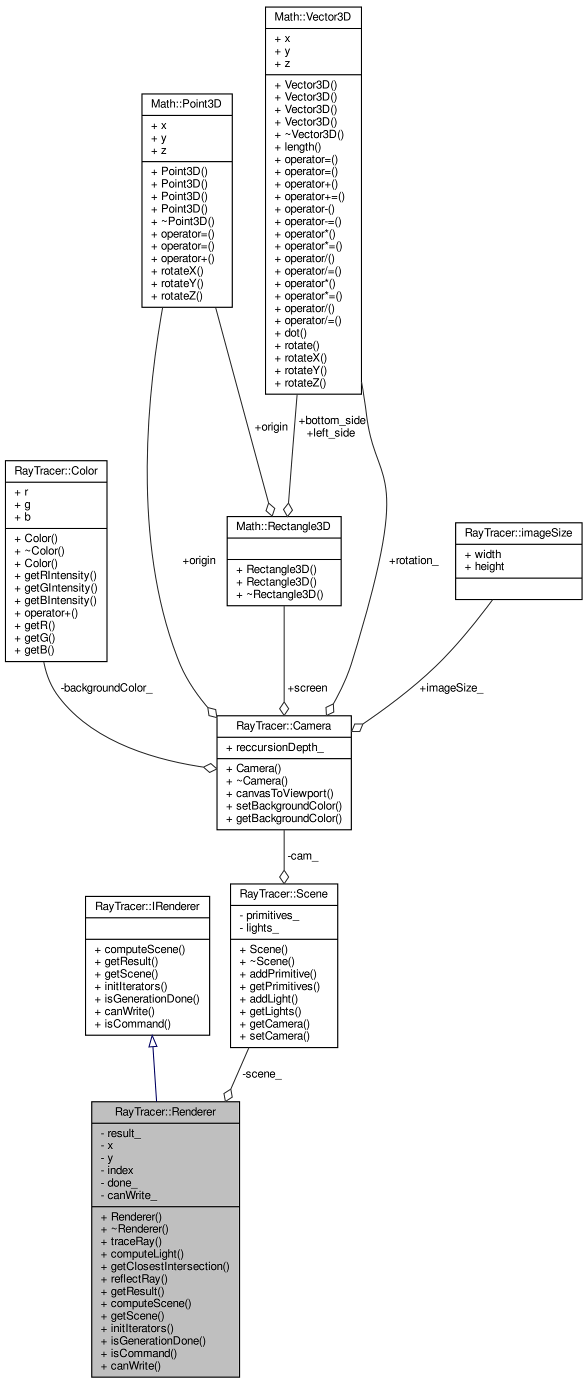
6.30 RayTracer::Renderer Class Reference

```
#include <Renderer.hpp>
```

Inheritance diagram for RayTracer::Renderer:



Collaboration diagram for RayTracer::Renderer:



Public Member Functions

- Renderer ()=default
- ∼Renderer ()=default
- Color traceRay (RayTracer::Ray ray, double tMin, double tMax, int recursion_depth)
- Color computeLight (Math::Point3D intersectionPoint, Math::Vector3D normalVector, Math::Vector3D rayDir, int spec)

- intersection getClosestIntersection (RayTracer::Ray ray, double tMin, double tMax)
- Math::Vector3D reflectRay (Math::Vector3D normalVector, Math::Vector3D ray)
- std::vector< std::vector< Color > > getResult () override

  Get the result of the rendering as a 2D vector of colors.
- void computeScene () override

  Compute the scene and render the result.
- Scene & getScene () override

  Get the scene used for rendering.
- void initIterators () override

  Initializes the iterators for generation.
- bool isGenerationDone () override

  Checks if the generation process is done.
- bool isCommand () override

  Checks if the current action is a command.
- bool canWrite () override

  Checks if writing is allowed.

Private Attributes

- Scene scene_ {}
- std::vector< std::vector< Color > > result_
- double x
- double y
- std::size_t index = 0
- bool done_ { false }
- bool canWrite_ { false }

6.30.1 Constructor & Destructor Documentation

6.30.1.1 Renderer()

```
RayTracer::Renderer::Renderer ( )  [default]
```

6.30.1.2 ∼Renderer()

```
RayTracer::Renderer::∼Renderer ( )  [default]
```

6.30.2 Member Function Documentation

6.30.2.1 canWrite()

```
bool RayTracer::Renderer::canWrite ( )  [override], [virtual]
```

Checks if writing is allowed.

Returns

True if writing is allowed, False otherwise

Implements RayTracer::IRenderer.

6.30.2.2 computeLight()

```
Color RayTracer::Renderer::computeLight (
            Math::Point3D intersectionPoint,
            Math::Vector3D normalVector,
            Math::Vector3D rayDir,
            int spec )
```

6.30.2.3 computeScene()

```
void RayTracer::Renderer::computeScene ( )  [override], [virtual]
```

Compute the scene and render the result.

Implements RayTracer::IRenderer.

6.30.2.4 getClosestIntersection()

```
intersection RayTracer::Renderer::getClosestIntersection (
            RayTracer::Ray ray,
            double tMin,
            double tMax )
```

6.30.2.5 getResult()

```
std::vector< std::vector< Color > > RayTracer::Renderer::getResult ( )  [override], [virtual]
```

Get the result of the rendering as a 2D vector of colors.

Returns

The result of the rendering as a 2D vector of colors.

Implements RayTracer::IRenderer.

6.30.2.6 getScene()

```
Scene & RayTracer::Renderer::getScene ( )  [override], [virtual]
```

Get the scene used for rendering.

Returns

The scene used for rendering.

Implements RayTracer::IRenderer.

6.30.2.7 initIterators()

```
void RayTracer::Renderer::initIterators ( )  [override], [virtual]
```

Initializes the iterators for generation.

Implements RayTracer::IRenderer.

6.30.2.8 isCommand()

```
bool RayTracer::Renderer::isCommand ( )  [override], [virtual]
```

Checks if the current action is a command.

Returns

True if the current action is a command, False otherwise

Implements RayTracer::IRenderer.

6.30.2.9 isGenerationDone()

```
bool RayTracer::Renderer::isGenerationDone ( )  [override], [virtual]
```

Checks if the generation process is done.

Returns

True if the generation is done, False otherwise

Implements RayTracer::IRenderer.

6.30.2.10 reflectRay()

```
Math::Vector3D RayTracer::Renderer::reflectRay (
            Math::Vector3D normalVector,
            Math::Vector3D ray )
```

6.30.2.11 traceRay()

```
Color RayTracer::Renderer::traceRay (
            RayTracer::Ray ray,
            double tMin,
            double tMax,
            int recursion_depth )
```

6.30.3 Field Documentation

6.30.3.1 canWrite_

```
bool RayTracer::Renderer::canWrite_ { false }  [private]
```

6.30.3.2 done_

```
bool RayTracer::Renderer::done_ { false }  [private]
```

6.30.3.3 index

```
std::size_t RayTracer::Renderer::index = 0  [private]
```

6.30.3.4 result_

```
std::vector<std::vector<Color> > RayTracer::Renderer::result_  [private]
```

6.30.3.5 scene_

```
Scene RayTracer::Renderer::scene_ {}  [private]
```

6.30.3.6 x

```
double RayTracer::Renderer::x  [private]
```

6.30.3.7 y

```
double RayTracer::Renderer::y  [private]
```

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

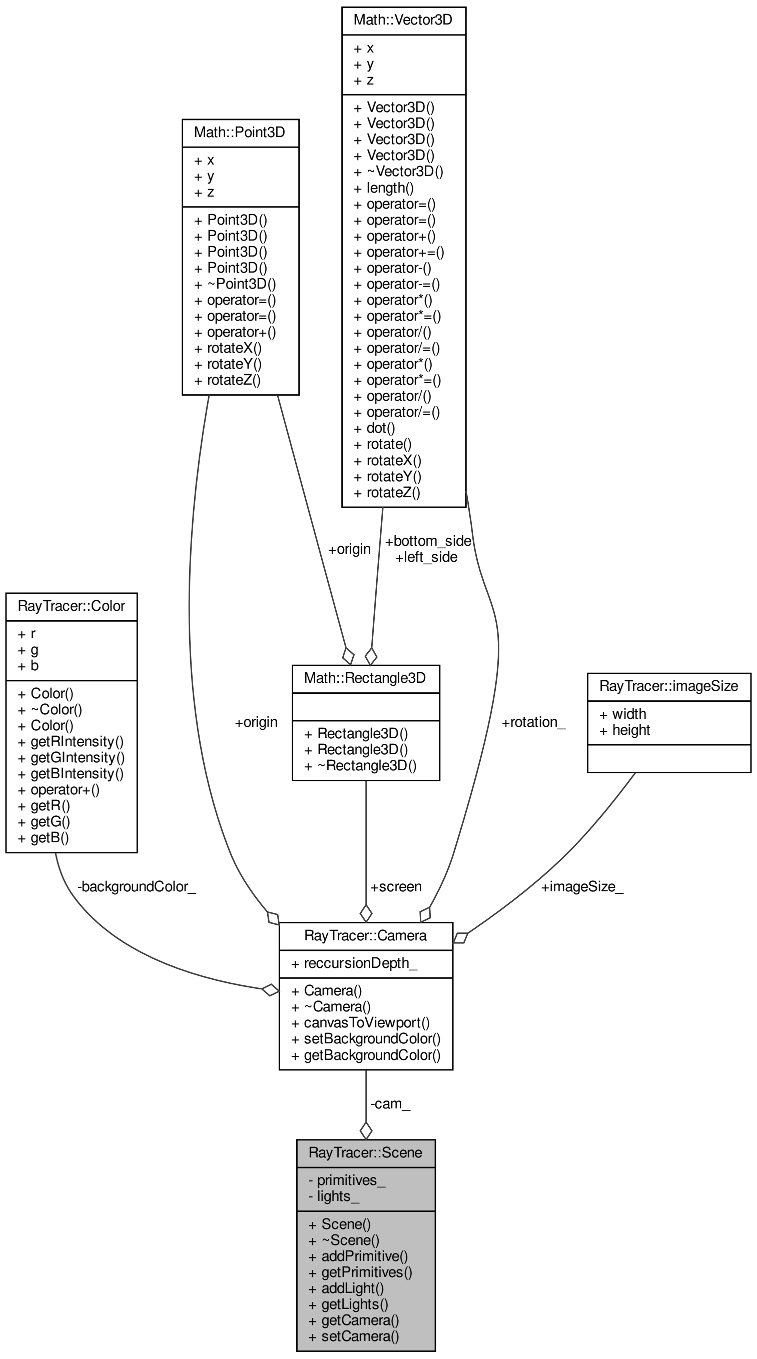
- src/plugins/renderer/baseRenderer/Renderer.hpp
- src/plugins/renderer/baseRenderer/Renderer.cpp

6.31 RayTracer::Scene Class Reference

Class for the scene.

```
#include <Scene.hpp>
```

Collaboration diagram for RayTracer::Scene:



Public Member Functions

- Scene ()=default
- ∼Scene ()=default
- void addPrimitive (std::unique_ptr< IPrimitives > prim)

  Adds a new primitive object to the scene.
- std::vector< std::unique_ptr< IPrimitives > > & getPrimitives ()

Returns a reference to the vector of primitives in the scene.

- void addLight (std::unique_ptr< ILight > light)

  Adds a new light source to the scene.
- std::vector< std::unique_ptr< ILight > > & getLights ()

  Returns a reference to the vector of light sources in the scene.
- Camera & getCamera ()

  Returns a reference to the camera object in the scene.
- void setCamera (Camera cam)

  Sets the camera object in the scene.

Private Attributes

- std::vector< std::unique_ptr< IPrimitives > > primitives_
- std::vector< std::unique_ptr< ILight > > lights_
- Camera cam_ {}

6.31.1 Detailed Description

Class for the scene.

6.31.2 Constructor & Destructor Documentation

6.31.2.1 Scene()

```
RayTracer::Scene::Scene ( )  [default]
```

6.31.2.2 ∼Scene()

```
RayTracer::Scene::∼Scene ( )  [default]
```

6.31.3 Member Function Documentation

6.31.3.1 addLight()

```
void RayTracer::Scene::addLight (
            std::unique_ptr< ILight > light )
```

Adds a new light source to the scene.

Parameters

light	A unique pointer to the light source to add.

6.31.3.2 addPrimitive()

```
void RayTracer::Scene::addPrimitive (
            std::unique_ptr< IPrimitives > prim )
```

Adds a new primitive object to the scene.

Parameters

prim	A unique pointer to the primitive object to add.

6.31.3.3 getCamera()

```
Camera & RayTracer::Scene::getCamera ( )
```

Returns a reference to the camera object in the scene.

Returns

A reference to the camera object in the scene.

6.31.3.4 getLights()

```
std::vector< std::unique_ptr< ILight > > & RayTracer::Scene::getLights ( )
```

Returns a reference to the vector of light sources in the scene.

Returns

A reference to the vector of unique pointers to the light sources in the scene.

6.31.3.5 getPrimitives()

```
std::vector< std::unique_ptr< IPrimitives > > & RayTracer::Scene::getPrimitives ( )
```

Returns a reference to the vector of primitives in the scene.

Returns

A reference to the vector of unique pointers to the primitives in the scene.

6.31.3.6 setCamera()

```
void RayTracer::Scene::setCamera (
             RayTracer::Camera cam )
```

Sets the camera object in the scene.

Parameters

cam	The new camera object to set.

6.31.4 Field Documentation

6.31.4.1 cam_

```
Camera RayTracer::Scene::cam_ {}  [private]
```

6.31.4.2 lights_

```
std::vector<std::unique_ptr<ILight> > RayTracer::Scene::lights_  [private]
```

6.31.4.3 primitives_

```
std::vector<std::unique_ptr<IPrimitives> > RayTracer::Scene::primitives_  [private]
```

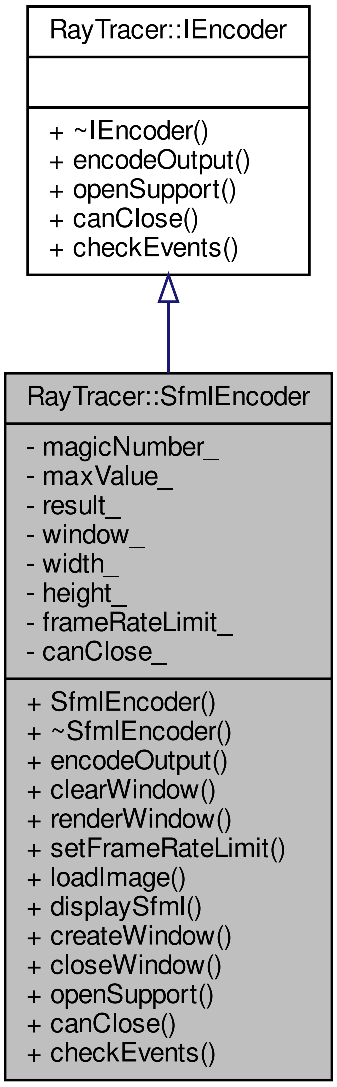
The documentation for this class was generated from the following files:

- include/Scene.hpp
- src/utils/Scene.cpp

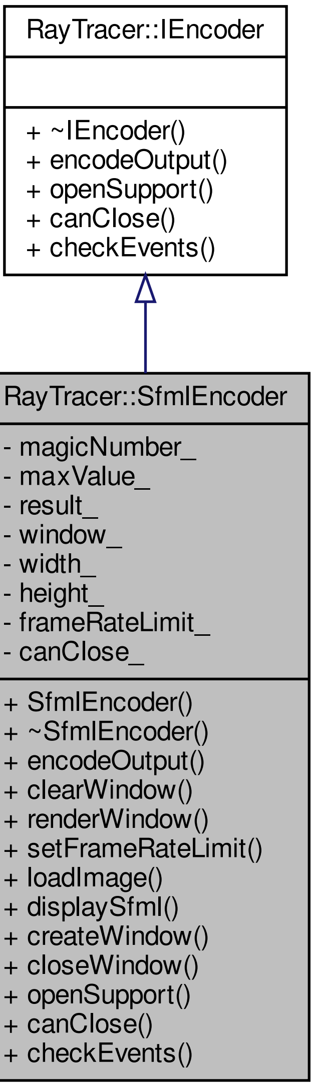
6.32 RayTracer::SfmlEncoder Class Reference

```
#include <Encoder.hpp>
```

Inheritance diagram for RayTracer::SfmlEncoder:



Collaboration diagram for RayTracer::SfmlEncoder:



Data Structures

- struct Image

Public Member Functions

- SfmlEncoder ()=default
- ∼SfmlEncoder () override=default
- void encodeOutput (std::vector< std::vector< Color >> result_, const std::string &filename) override

    Encode the output into a ppm image.
- void clearWindow ()

Clear the window.
- void renderWindow ()

    Render the window.
- void setFrameRateLimit ()

    Set the Frame Rate Limit object.
- sf::Image loadImage (std::vector< std::vector< Color >> result)

    Draw the image.
- void displaySfml (std::vector< std::vector< Color >> result)

    Display the image.
- void createWindow (const std::string &name)

    Create a Window object.
- void closeWindow ()

    Close the window.
- void openSupport (const std::string &name, imageSize size) override

    Opens the necessary support for encoding.
- bool canClose () override

    Checks if the encoder can be closed.
- void checkEvents () override

    Checks for any pending events or actions.

Private Attributes

- std::string magicNumber_ { HEADER_MAGIC_NUMBER "\n" }

    Magic number (P3) indicates that the colors are in ASCII and are in RGB format.
- unsigned int maxValue_ { MAX_VALUE }

    Maximum value of a color.
- std::vector< std::vector< Color > > result_

    Result of the raytracer calculations.
- sf::RenderWindow window_
- long unsigned int width_
- long unsigned int height_
- unsigned int frameRateLimit_ { FRAME_RATE_LIMIT }
- bool canClose_ { false }

6.32.1 Constructor & Destructor Documentation

6.32.1.1 SfmlEncoder()

```
RayTracer::SfmlEncoder::SfmlEncoder ( )  [default]
```

6.32.1.2 ∼SfmlEncoder()

```
RayTracer::SfmlEncoder::∼SfmlEncoder ( )  [override], [default]
```

6.32.2 Member Function Documentation

6.32.2.1 canClose()

```
bool RayTracer::SfmlEncoder::canClose ( )  [override], [virtual]
```

Checks if the encoder can be closed.

Returns

True if the encoder can be closed, False otherwise

Implements RayTracer::IEncoder.

6.32.2.2 checkEvents()

```
void RayTracer::SfmlEncoder::checkEvents ( )  [override], [virtual]
```

Checks for any pending events or actions.

Implements RayTracer::IEncoder.

6.32.2.3 clearWindow()

```
void RayTracer::SfmlEncoder::clearWindow ( )
```

Clear the window.

6.32.2.4 closeWindow()

```
void RayTracer::SfmlEncoder::closeWindow ( )
```

Close the window.

6.32.2.5 createWindow()

```
void RayTracer::SfmlEncoder::createWindow (
             const std::string & name )
```

Create a Window object.

6.32.2.6 displaySfml()

```
void RayTracer::SfmlEncoder::displaySfml (
             std::vector< std::vector< Color >> result )
```

Display the image.

Parameters

filename	

6.32.2.7 encodeOutput()

```
void RayTracer::SfmlEncoder::encodeOutput (
            std::vector< std::vector< Color >> result_,
            const std::string & filename )  [override], [virtual]
```

Encode the output into a ppm image.

Parameters

result←↩ _	
filename	

Implements RayTracer::IEncoder.

6.32.2.8 loadImage()

```
sf::Image RayTracer::SfmlEncoder::loadImage (
            std::vector< std::vector< Color >> result )
```

Draw the image.

Parameters

filename	

6.32.2.9 openSupport()

```
void RayTracer::SfmlEncoder::openSupport (
            const std::string & name,
            imageSize size )  [override], [virtual]
```

Opens the necessary support for encoding.

Parameters

name	The name of the support to be opened
size	The size of the image to be encoded

Implements RayTracer::IEncoder.

6.32.2.10 renderWindow()

```
void RayTracer::SfmlEncoder::renderWindow ( )
```

Render the window.

6.32.2.11 setFrameRateLimit()

```
void RayTracer::SfmlEncoder::setFrameRateLimit ( )
```

Set the Frame Rate Limit object.

6.32.3 Field Documentation

6.32.3.1 canClose_

```
bool RayTracer::SfmlEncoder::canClose_ { false }  [private]
```

6.32.3.2 frameRateLimit_

```
unsigned int RayTracer::SfmlEncoder::frameRateLimit_ { FRAME_RATE_LIMIT }  [private]
```

6.32.3.3 height_

```
long unsigned int RayTracer::SfmlEncoder::height_  [private]
```

6.32.3.4 magicNumber_

```
std::string RayTracer::SfmlEncoder::magicNumber_ { HEADER_MAGIC_NUMBER "\n" }  [private]
```

Magic number (P3) indicates that the colors are in ASCII and are in RGB format.

6.32.3.5 maxValue_

```
unsigned int RayTracer::SfmlEncoder::maxValue_ { MAX_VALUE }  [private]
```

Maximum value of a color.

6.32.3.6 result_

```
std::vector<std::vector<Color> > RayTracer::SfmlEncoder::result_  [private]
```

Result of the raytracer calculations.

6.32.3.7 width_

```
long unsigned int RayTracer::SfmlEncoder::width_  [private]
```

6.32.3.8 window_

```
sf::RenderWindow RayTracer::SfmlEncoder::window_  [private]
```

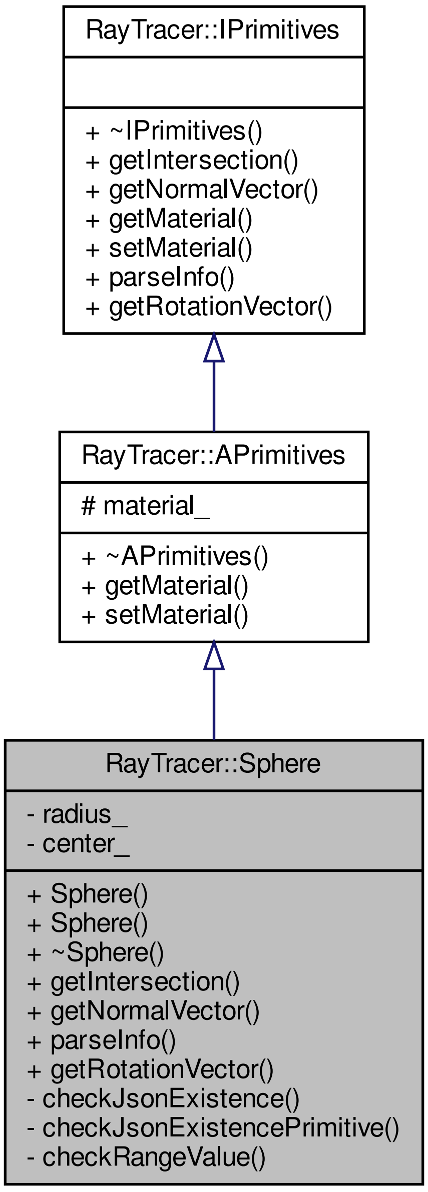
The documentation for this class was generated from the following files:

- src/plugins/encoder/sfmlEncoder/Encoder.hpp
- src/plugins/encoder/sfmlEncoder/Encoder.cpp

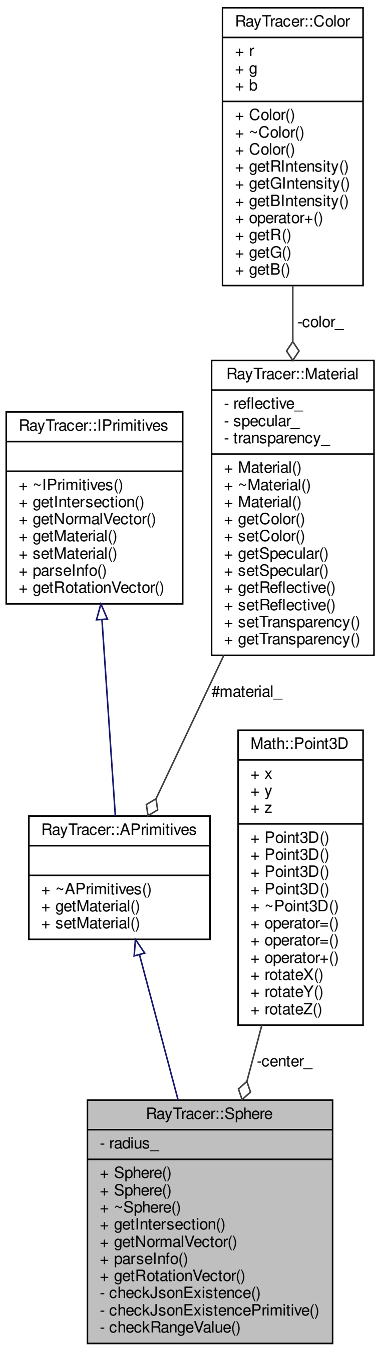
6.33 RayTracer::Sphere Class Reference

```
#include <Sphere.hpp>
```

Inheritance diagram for RayTracer::Sphere:



Collaboration diagram for RayTracer::Sphere:



Public Member Functions

- Sphere (double radius, Math::Point3D center)
- Sphere ()=default
- ∼Sphere () override=default
- std::vector< double > getIntersection (RayTracer::Ray ray) final
- Math::Vector3D getNormalVector (Math::Point3D point) final

- void parseInfo (json object) final
- Math::Vector3D getRotationVector ()

Private Member Functions

- void checkJsonExistence (const json &scene, const std::string &field_name)
- void checkJsonExistencePrimitive (const json &scene)
- void checkRangeValue (const json &scene, const std::string &field_name, const std::string &comparison_↩ sign, double value)

Private Attributes

- double radius_ { 0 }
- Math::Point3D center_

Additional Inherited Members

6.33.1 Constructor & Destructor Documentation

6.33.1.1 Sphere() [1/2]

```
RayTracer::Sphere::Sphere (
            double radius,
            Math::Point3D center )
```

6.33.1.2 Sphere() [2/2]

```
RayTracer::Sphere::Sphere ( )  [default]
```

6.33.1.3 ∼Sphere()

```
RayTracer::Sphere::∼Sphere ( )  [override], [default]
```

6.33.2 Member Function Documentation

6.33.2.1 checkJsonExistence()

```
void RayTracer::Sphere::checkJsonExistence (
            const json & scene,
            const std::string & field_name )  [private]
```

6.33.2.2 checkJsonExistencePrimitive()

```
void RayTracer::Sphere::checkJsonExistencePrimitive (
            const json & scene )  [private]
```

6.33.2.3 checkRangeValue()

```
void RayTracer::Sphere::checkRangeValue (
            const json & scene,
            const std::string & field_name,
            const std::string & comparison_sign,
            double value )  [private]
```

6.33.2.4 getIntersection()

```
std::vector< double > RayTracer::Sphere::getIntersection (
            RayTracer::Ray ray )  [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.33.2.5 getNormalVector()

```
Math::Vector3D RayTracer::Sphere::getNormalVector (
            Math::Point3D point )  [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.33.2.6 getRotationVector()

```
Math::Vector3D RayTracer::Sphere::getRotationVector ( )  [virtual]
```

Implements RayTracer::IPrimitives.

6.33.2.7 parseInfo()

```
void RayTracer::Sphere::parseInfo (
            json object )  [final], [virtual]
```

Implements RayTracer::IPrimitives.

6.33.3 Field Documentation

6.33.3.1 center_

```
Math::Point3D RayTracer::Sphere::center_  [private]
```

6.33.3.2 radius_

```
double RayTracer::Sphere::radius_ { 0 }  [private]
```

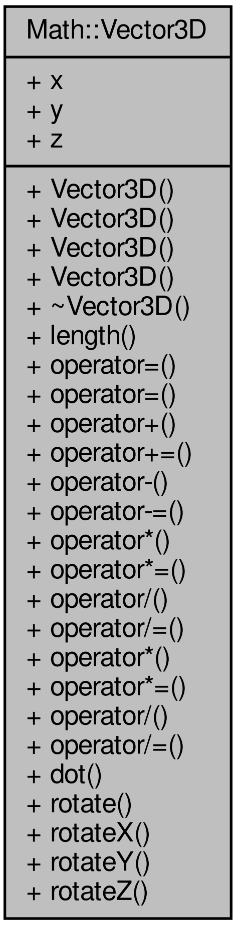
The documentation for this class was generated from the following files:

- src/plugins/primitives/sphere/Sphere.hpp
- src/plugins/primitives/sphere/Sphere.cpp

6.34 Math::Vector3D Class Reference

```
#include <Vector3D.hpp>
```

Collaboration diagram for Math::Vector3D:



Public Member Functions

- Vector3D ()=default
- Vector3D (double x, double y, double z)
- Vector3D (Vector3D &)=default
- Vector3D (Vector3D &&)=default
- ∼Vector3D ()=default
- double length () const
- Vector3D & operator= (const Vector3D &)=default
- Vector3D & operator= (Vector3D &&)=default
- Vector3D operator+ (const Vector3D &)

  Addition operator for vectors.
- Vector3D & operator+= (const Vector3D &)

  Addition operator for vectors with assignment.
- Vector3D operator- (const Vector3D &)

  Subtraction operator for vectors.

- Vector3D & operator-= (const Vector3D &)

  Subtraction operator for vectors with assignment.
- Vector3D operator∗ (const Vector3D &)

  Multiplication operator for vectors.
- Vector3D & operator∗= (const Vector3D &)

  Multiplication operator for vectors with assignment.
- Vector3D operator/ (const Vector3D &)

  Division operator for vectors.
- Vector3D & operator/= (const Vector3D &)

  Division operator for vectors with assignment.
- Vector3D operator∗ (double)

  Multiplication operator for scalar values.
- Vector3D & operator∗= (double)

  Multiplication operator for scalar values with assignment.
- Vector3D operator/ (double)

  Division operator for scalar values.
- Vector3D & operator/= (double)

  Division operator for scalar values with assignment.
- double dot (const Vector3D &)

  Calculates the dot product of this vector and another vector.
- void rotate (double x, double y, double z)

  Rotate the vector in the 3 directions.
- void rotateX (double x)

  Rotate the vector (origin and direction) on the x axis.
- void rotateY (double y)

  Rotate the vector (origin and direction) on the y axis.
- void rotateZ (double z)

  Rotate the vector (origin and direction) on the z axis.

Data Fields

- double x = 0
- double y = 0
- double z = 0

6.34.1 Constructor & Destructor Documentation

6.34.1.1 Vector3D() `[1/4]`

```
Math::Vector3D::Vector3D ( )  [default]
```

6.34.1.2 Vector3D() [2/4]

```
Math::Vector3D::Vector3D (
             double x,
             double y,
             double z )
```

6.34.1.3 Vector3D() [3/4]

```
Math::Vector3D::Vector3D (
             Vector3D & )  [default]
```

6.34.1.4 Vector3D() [4/4]

```
Math::Vector3D::Vector3D (
             Vector3D && )  [default]
```

6.34.1.5 ∼Vector3D()

```
Math::Vector3D::∼Vector3D ( )  [default]
```

6.34.2 Member Function Documentation

6.34.2.1 dot()

```
double Math::Vector3D::dot (
             const Vector3D & vect )
```

Calculates the dot product of this vector and another vector.

Parameters

other	The other vector to calculate the dot product with.

Returns

The dot product of the two vectors as a double value.

6.34.2.2 length()

```
double Math::Vector3D::length ( ) const
```

6.34.2.3 operator*() [1/2]

```
Vector3D Math::Vector3D::operator* (
             const Vector3D & vect )
```

Multiplication operator for vectors.

Parameters

vector	The vector to multiply.

Returns

A new vector resulting from the multiplication of the two vectors.

6.34.2.4 operator*() [2/2]

```
Vector3D Math::Vector3D::operator* (
             double value )
```

Multiplication operator for scalar values.

Parameters

scalar	The scalar value to multiply.

Returns

A new vector resulting from the multiplication of the vector by the scalar.

6.34.2.5 operator*=() [1/2]

```
Vector3D & Math::Vector3D::operator*= (
             const Vector3D & vect )
```

Multiplication operator for vectors with assignment.

Parameters

vector	The vector to multiply.

Returns

A reference to the current vector after multiplying the vector passed as a parameter.

6.34.2.6 operator∗=() [2/2]

```
Vector3D & Math::Vector3D::operator*= (
             double value )
```

Multiplication operator for scalar values with assignment.

Parameters

scalar	The scalar value to multiply.

Returns

A reference to the current vector after multiplying the vector by the scalar value.

6.34.2.7 operator+()

```
Vector3D Math::Vector3D::operator+ (
             const Vector3D & vect )
```

Addition operator for vectors.

Parameters

vector	The vector to add.

Returns

A new vector resulting from the addition of the two vectors.

6.34.2.8 operator+=()

```
Vector3D & Math::Vector3D::operator+= (
             const Vector3D & vect )
```

Addition operator for vectors with assignment.

Parameters

vector	The vector to add.

Returns

A reference to the current vector after adding the vector passed as a parameter.

6.34.2.9 operator-()

```
Vector3D Math::Vector3D::operator- (
             const Vector3D & vect )
```

Subtraction operator for vectors.

Parameters

vector	The vector to subtract.

Returns

A new vector resulting from the subtraction of the two vectors.

6.34.2.10 operator-=()

```
Vector3D & Math::Vector3D::operator-= (
             const Vector3D & vect )
```

Subtraction operator for vectors with assignment.

Parameters

vector	The vector to subtract.

Returns

A reference to the current vector after subtracting the vector passed as a parameter.

6.34.2.11 operator/() [1/2]

```
Vector3D Math::Vector3D::operator/ (
             const Vector3D & vect )
```

Division operator for vectors.

Parameters

vector	The vector to divide.

Returns

A new vector resulting from the division of the two vectors.

6.34.2.12 operator/() [2/2]

```
Vector3D Math::Vector3D::operator/ (
             double value )
```

Division operator for scalar values.

Parameters

scalar	The scalar value to divide.

Returns

A new vector resulting from the division of the vector by the scalar.

6.34.2.13 operator/=() [1/2]

```
Vector3D & Math::Vector3D::operator/= (
             const Vector3D & vect )
```

Division operator for vectors with assignment.

Parameters

vector	The vector to divide.

Returns

A reference to the current vector after dividing the vector passed as a parameter.

6.34.2.14 operator/=() [2/2]

```
Vector3D & Math::Vector3D::operator/= (
             double value )
```

Division operator for scalar values with assignment.

Parameters

scalar	The scalar value to divide.

Returns

A reference to the current vector after dividing the vector by the scalar value.

6.34.2.15 operator=() [1/2]

```
Vector3D& Math::Vector3D::operator= (
             const Vector3D &  )  [default]
```

6.34.2.16 operator=() [2/2]

```
Vector3D& Math::Vector3D::operator= (
             Vector3D &&  )  [default]
```

6.34.2.17 rotate()

```
void Math::Vector3D::rotate (
             double x,
             double y,
             double z )
```

Rotate the vector in the 3 directions.

Parameters

x	The x angle in radian
y	The y angle in radian
z	The z angle in radian

6.34.2.18 rotateX()

```
void Math::Vector3D::rotateX (
             double x )
```

Rotate the vector (origin and direction) on the x axis.

Parameters

x	The x angle in radian

6.34.2.19 rotateY()

```
void Math::Vector3D::rotateY (
             double y )
```

Rotate the vector (origin and direction) on the y axis.

Parameters

y	The y angle in radian

6.34.2.20 rotateZ()

```
void Math::Vector3D::rotateZ (
             double z )
```

Rotate the vector (origin and direction) on the z axis.

Parameters

z	The z angle in radian

6.34.3 Field Documentation

6.34.3.1 x

```
double Math::Vector3D::x = 0
```

6.34.3.2 y

```
double Math::Vector3D::y = 0
```

6.34.3.3 z

```
double Math::Vector3D::z = 0
```

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

- include/maths/Vector3D.hpp
- src/maths/Vector3D.cpp

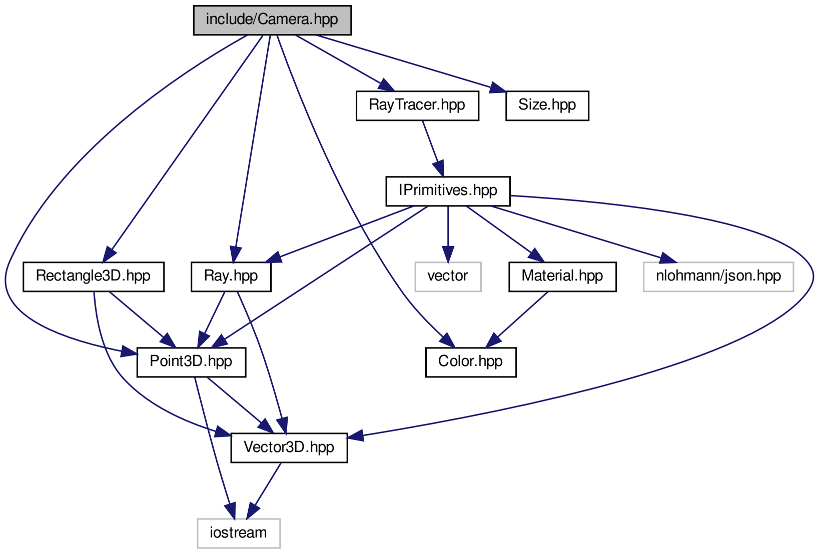
Chapter 7

File Documentation

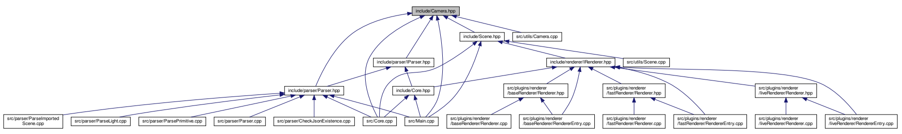
7.1 include/Camera.hpp File Reference

```
#include "Color.hpp"
#include "Point3D.hpp"
#include "Ray.hpp"
#include "RayTracer.hpp"
#include "Rectangle3D.hpp"
#include "Size.hpp"
```

Include dependency graph for Camera.hpp:



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


include/Camera.hpp
include/Scene.hpp
src/utils/Camera.cpp
include/parser/IParser.hpp
include/renderer/IRenderer.hpp
src/utils/Scene.cpp
include/parser/Parser.hpp
include/Core.hpp
src/plugins/renderer /baseRenderer/Renderer.hpp
src/plugins/renderer /fastRenderer/Renderer.hpp
src/plugins/renderer /liveRenderer/Renderer.hpp
src/parser/ParseImported Scene.cpp
src/parser/ParseLight.cpp
src/parser/ParsePrimitive.cpp
src/parser/Parser.cpp
src/parser/CheckJsonExistence.cpp
src/Core.cpp
src/Main.cpp
src/plugins/renderer /baseRenderer/Renderer.cpp
src/plugins/renderer /baseRenderer/RendererEntry.cpp
src/plugins/renderer /fastRenderer/Renderer.cpp
src/plugins/renderer /fastRenderer/RendererEntry.cpp
src/plugins/renderer /liveRenderer/Renderer.cpp
src/plugins/renderer /liveRenderer/RendererEntry.cpp

Data Structures

- class RayTracer::Camera

Namespaces

- RayTracer

  Namespace for the raytracer.

Macros

- #define PI_RAD 3.14159265 / 180

7.1.1 Macro Definition Documentation

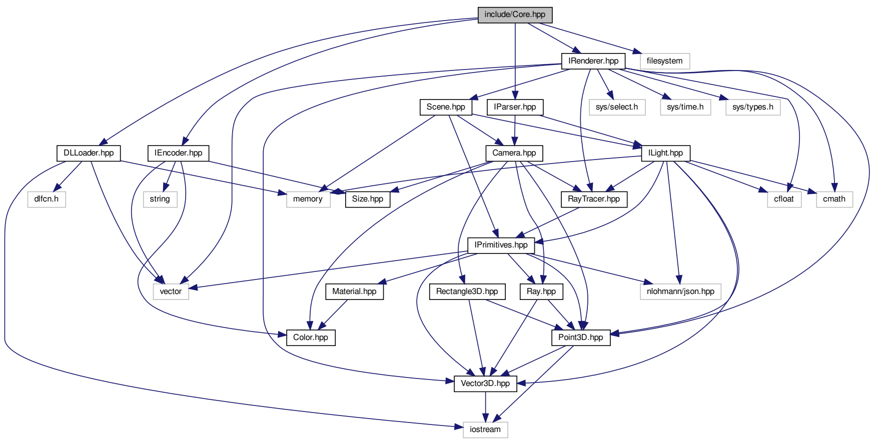
7.1.1.1 PI_RAD

```
#define PI_RAD 3.14159265 / 180
```

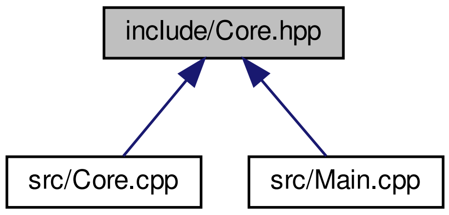
7.2 include/Core.hpp File Reference

```
#include "DLLoader.hpp"
#include "IEncoder.hpp"
#include "IParser.hpp"
#include "IRenderer.hpp"
#include <filesystem>
```

Include dependency graph for Core.hpp:



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



Data Structures

- class RayTracer::Core

Namespaces

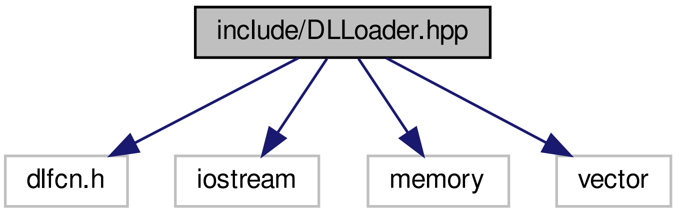
- RayTracer

  Namespace for the raytracer.

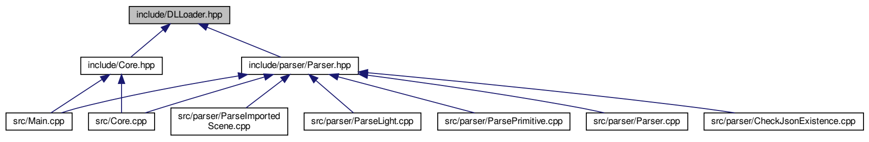
7.3 include/DLLoader.hpp File Reference

```
#include <dlfcn.h>
#include <iostream>
#include <memory>
#include <vector>
```

Include dependency graph for DLLoader.hpp:



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


include/DLLoader.hpp
include/Core.hpp
include/parser/Parser.hpp
src/Main.cpp
src/Core.cpp
src/parser/ParseImported Scene.cpp
src/parser/ParseLight.cpp
src/parser/ParsePrimitive.cpp
src/parser/Parser.cpp
src/parser/CheckJsonExistence.cpp

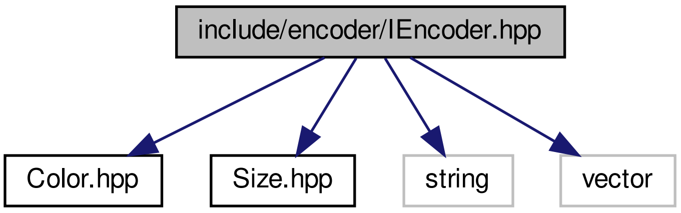
Data Structures

- class DLLoader< T >

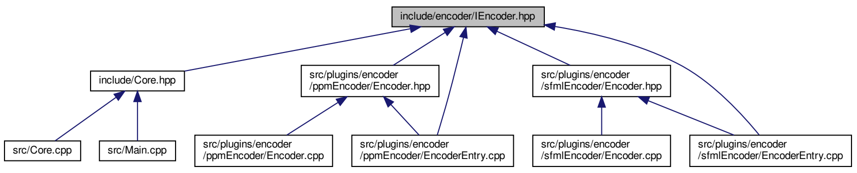
7.4 include/encoder/IEncoder.hpp File Reference

```
#include "Color.hpp"
#include "Size.hpp"
#include <string>
#include <vector>
```

Include dependency graph for IEncoder.hpp:



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


include/encoder/IEncoder.hpp
include/Core.hpp
src/plugins/encoder /ppmEncoder/Encoder.hpp
src/plugins/encoder /sfmlEncoder/Encoder.hpp
src/Core.cpp
src/Main.cpp
src/plugins/encoder /ppmEncoder/Encoder.cpp
src/plugins/encoder /ppmEncoder/EncoderEntry.cpp
src/plugins/encoder /sfmlEncoder/Encoder.cpp
src/plugins/encoder /sfmlEncoder/EncoderEntry.cpp

Data Structures

- class RayTracer::IEncoder

Namespaces

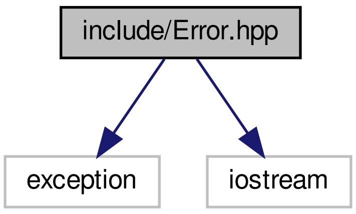
- RayTracer

  Namespace for the raytracer.

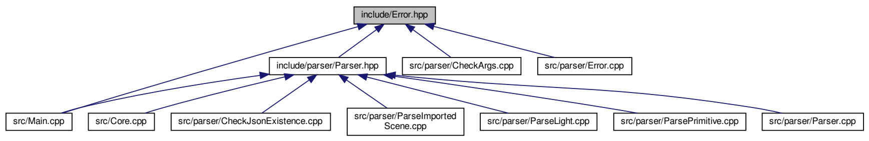
7.5 include/Error.hpp File Reference

```
#include <exception>
#include <iostream>
```

Include dependency graph for Error.hpp:



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


include/Error.hpp
include/parser/Parser.hpp
src/parser/CheckArgs.cpp
src/parser/Error.cpp
src/Main.cpp
src/Core.cpp
src/parser/CheckJsonExistence.cpp
src/parser/ParseImported Scene.cpp
src/parser/ParseLight.cpp
src/parser/ParsePrimitive.cpp
src/parser/Parser.cpp

Data Structures

- class ParsingError

Macros

- #define EPITECH_ERROR 84

7.5.1 Macro Definition Documentation

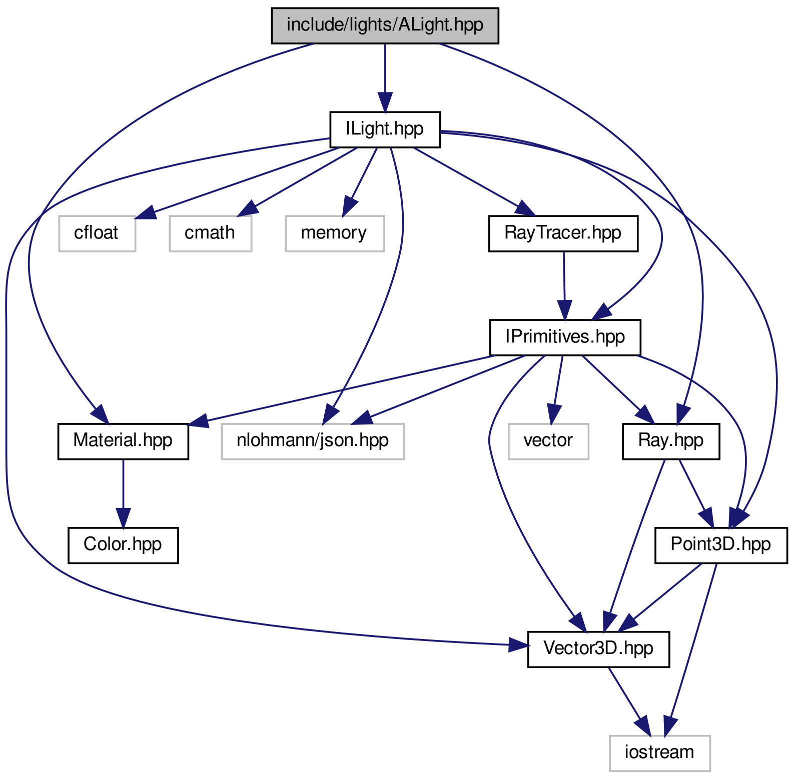
7.5.1.1 EPITECH_ERROR

```
#define EPITECH_ERROR 84
```

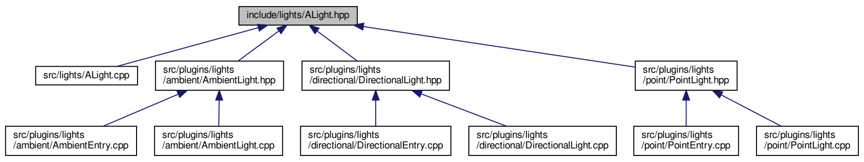
7.6 include/lights/ALight.hpp File Reference

```
#include "ILight.hpp"
#include "Material.hpp"
#include "Ray.hpp"
```

Include dependency graph for ALight.hpp:



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


include/lights/ALight.hpp
src/lights/ALight.cpp
src/plugins/lights /ambient/AmbientLight.hpp
src/plugins/lights /directional/DirectionalLight.hpp
src/plugins/lights /point/PointLight.hpp
src/plugins/lights /ambient/AmbientEntry.cpp
src/plugins/lights /ambient/AmbientLight.cpp
src/plugins/lights /directional/DirectionalEntry.cpp
src/plugins/lights /directional/DirectionalLight.cpp
src/plugins/lights /point/PointEntry.cpp
src/plugins/lights /point/PointLight.cpp

Data Structures

- class RayTracer::ALight

Namespaces

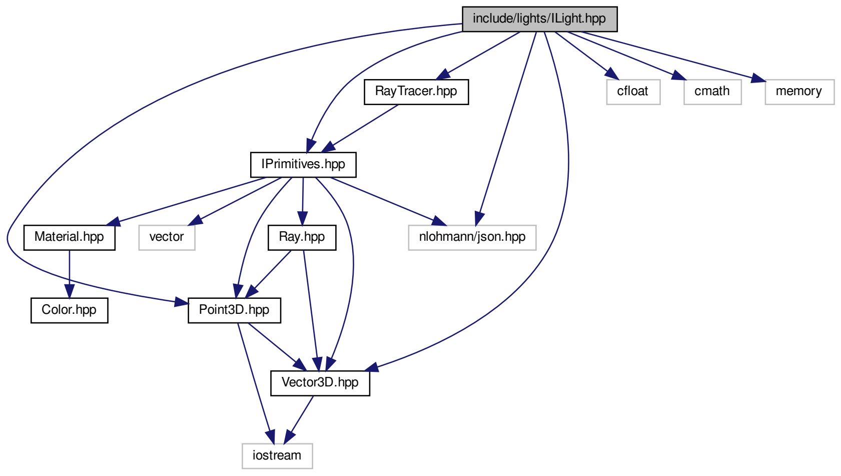
- RayTracer

  Namespace for the raytracer.

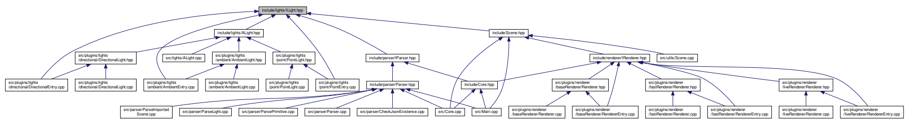
7.7 include/lights/ILight.hpp File Reference

```
#include "IPrimitives.hpp"
#include "Point3D.hpp"
#include "RayTracer.hpp"
#include "Vector3D.hpp"
#include <cfloat>
#include <cmath>
#include <memory>
#include <nlohmann/json.hpp>
```

Include dependency graph for ILight.hpp:



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


include/lights/ILight.hpp
include/lights/ALight.hpp
include/Scene.hpp
src/plugins/lights/directional/DirectionalLight.hpp
src/lights/ALight.cpp
src/plugins/lights/ambient/AmbientLight.hpp
src/plugins/lights/point/PointLight.hpp
include/parser/IParser.hpp
include/renderer/IRenderer.hpp
src/utils/Scene.cpp
src/plugins/lights/directional/DirectionalEntry.cpp
src/plugins/lights/directional/DirectionalLight.cpp
src/plugins/lights/ambient/AmbientEntry.cpp
src/plugins/lights/ambient/AmbientLight.cpp
src/plugins/lights/point/PointLight.cpp
src/plugins/lights/point/PointEntry.cpp
include/parser/Parser.hpp
include/Core.hpp
src/plugins/renderer/baseRenderer/Renderer.hpp
src/plugins/renderer/fastRenderer/Renderer.hpp
src/plugins/renderer/liveRenderer/Renderer.hpp
src/parser/ParseImportedScene.cpp
src/parser/ParseLight.cpp
src/parser/ParsePrimitive.cpp
src/parser/Parser.cpp
src/parser/CheckJsonExistence.cpp
src/Core.cpp
src/Main.cpp
src/plugins/renderer/baseRenderer/Renderer.cpp
src/plugins/renderer/baseRenderer/RendererEntry.cpp
src/plugins/renderer/fastRenderer/Renderer.cpp
src/plugins/renderer/fastRenderer/RendererEntry.cpp
src/plugins/renderer/liveRenderer/Renderer.cpp
src/plugins/renderer/liveRenderer/RendererEntry.cpp

Data Structures

- class RayTracer::ILight

Namespaces

- RayTracer

  Namespace for the raytracer.

Typedefs

- using json = nlohmann::json

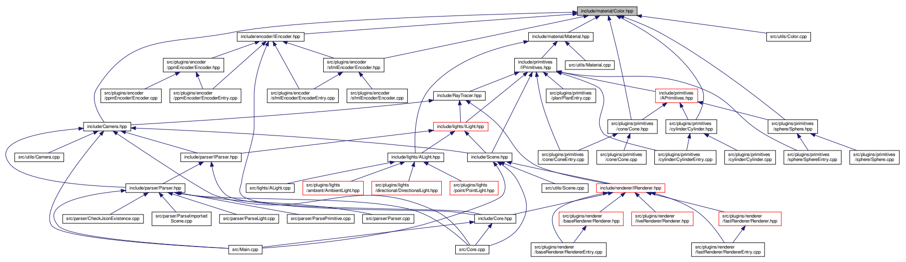
7.7.1 Typedef Documentation

7.7.1.1 json

```
using json = nlohmann::json
```

7.8 include/material/Color.hpp File Reference

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


include/material/Color.hpp
include/encoder/IEncoder.hpp
include/material/Material.hpp
src/utils/Color.cpp
src/plugins/encoder /ppmEncoder/Encoder.hpp
src/plugins/encoder /sfmlEncoder/Encoder.hpp
include/primitives /IPrimitives.hpp
src/utils/Material.cpp
src/plugins/encoder /ppmEncoder/Encoder.cpp
src/plugins/encoder /ppmEncoder/EncoderEntry.cpp
src/plugins/encoder /sfmlEncoder/EncoderEntry.cpp
src/plugins/encoder /sfmlEncoder/Encoder.cpp
include/RayTracer.hpp
src/plugins/primitives /plan/PlanEntry.cpp
include/primitives /APrimitives.hpp
include/Camera.hpp
include/lights/ILight.hpp
src/plugins/primitives /cone/Cone.hpp
src/plugins/primitives /cylinder/Cylinder.hpp
src/plugins/primitives /sphere/Sphere.hpp
src/utils/Camera.cpp
include/parser/IParser.hpp
include/lights/ALight.hpp
include/Scene.hpp
src/plugins/primitives /cone/ConeEntry.cpp
src/plugins/primitives /cone/Cone.cpp
src/plugins/primitives /cylinder/CylinderEntry.cpp
src/plugins/primitives /cylinder/Cylinder.cpp
src/plugins/primitives /sphere/SphereEntry.cpp
src/plugins/primitives /sphere/Sphere.cpp
include/parser/Parser.hpp
src/lights/ALight.cpp
src/plugins/lights /ambient/AmbientLight.hpp
src/plugins/lights /directional/DirectionalLight.hpp
src/plugins/lights /point/PointLight.hpp
src/utils/Scene.cpp
include/renderer/IRenderer.hpp
src/parser/CheckJsonExistence.cpp
src/parser/ParseImported Scene.cpp
src/parser/ParseLight.cpp
src/parser/ParsePrimitive.cpp
src/parser/Parser.cpp
include/Core.hpp
src/plugins/renderer /baseRenderer/Renderer.hpp
src/plugins/renderer /liveRenderer/Renderer.hpp
src/plugins/renderer /fastRenderer/Renderer.hpp
src/Main.cpp
src/Core.cpp
src/plugins/renderer /baseRenderer/RendererEntry.cpp
src/plugins/renderer /fastRenderer/RendererEntry.cpp

Data Structures

- class RayTracer::Color

Namespaces

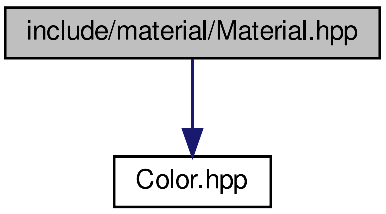
- RayTracer

  Namespace for the raytracer.

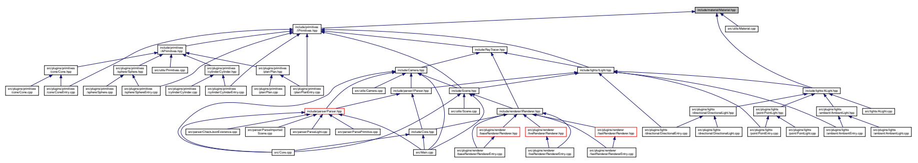
7.9 include/material/Material.hpp File Reference

```
#include "Color.hpp"
```

Include dependency graph for Material.hpp:



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



Data Structures

- class RayTracer::Material

  Material class representing the properties of a surface of an object.

Namespaces

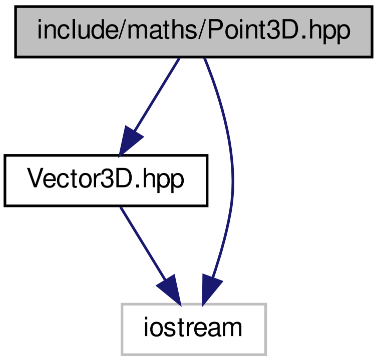
- RayTracer

  Namespace for the raytracer.

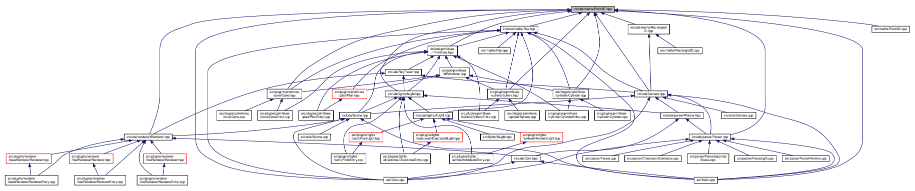
7.10 include/maths/Point3D.hpp File Reference

```
#include "Vector3D.hpp"
#include <iostream>
```

Include dependency graph for Point3D.hpp:



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



Data Structures

- class Math::Point3D

  Class for the 3D point.

Namespaces

- Math

  Namespace for the math functions.

Functions

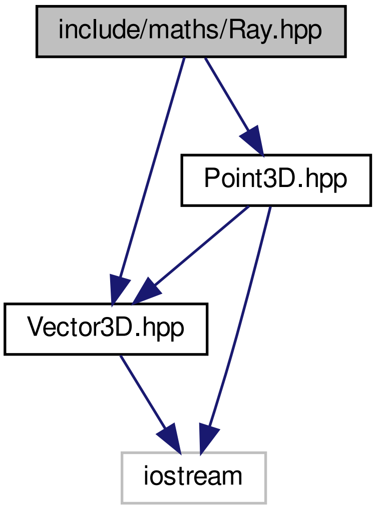
- std::ostream & Math::operator<< (std::ostream &os, const Point3D &vect)

  Outputs a human-readable representation of the given point to the given output stream.

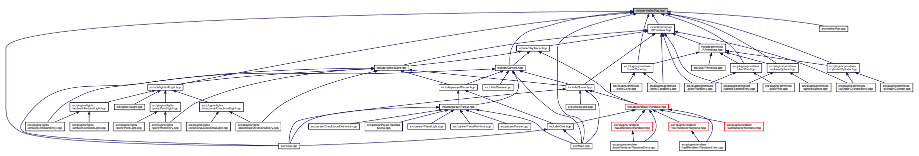
7.11 include/maths/Ray.hpp File Reference

```
#include "Point3D.hpp"
#include "Vector3D.hpp"
```

Include dependency graph for Ray.hpp:



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



Data Structures

- class RayTracer::Ray

    Class for the ray.

Namespaces

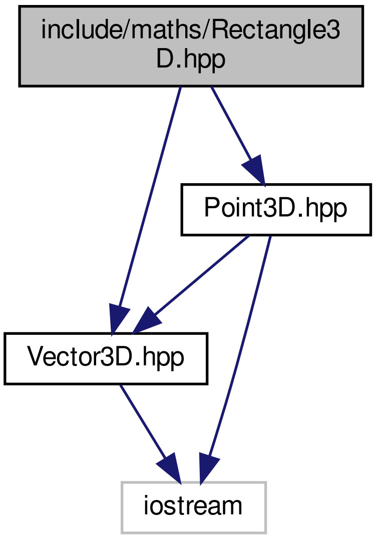
- RayTracer

    Namespace for the raytracer.

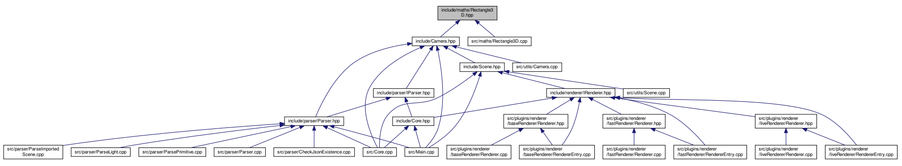
7.12 include/maths/Rectangle3D.hpp File Reference

```
#include "Point3D.hpp"
#include "Vector3D.hpp"
```

Include dependency graph for Rectangle3D.hpp:



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


include/maths/Rectangle3D.hpp
include/Camera.hpp
src/maths/Rectangle3D.cpp
include/Scene.hpp
src/utils/Camera.cpp
include/parser/IParser.hpp
include/renderer/IRenderer.hpp
src/utils/Scene.cpp
include/parser/Parser.hpp
include/Core.hpp
src/plugins/renderer/baseRenderer/Renderer.hpp
src/plugins/renderer/fastRenderer/Renderer.hpp
src/plugins/renderer/liveRenderer/Renderer.hpp
src/parser/ParseImportedScene.cpp
src/parser/ParseLight.cpp
src/parser/ParsePrimitive.cpp
src/parser/Parser.cpp
src/parser/CheckJsonExistence.cpp
src/Core.cpp
src/Main.cpp
src/plugins/renderer/baseRenderer/Renderer.cpp
src/plugins/renderer/baseRenderer/RendererEntry.cpp
src/plugins/renderer/fastRenderer/Renderer.cpp
src/plugins/renderer/fastRenderer/RendererEntry.cpp
src/plugins/renderer/liveRenderer/Renderer.cpp
src/plugins/renderer/liveRenderer/RendererEntry.cpp

Data Structures

- class Math::Rectangle3D

  Class for the 3D rectangle.

Namespaces

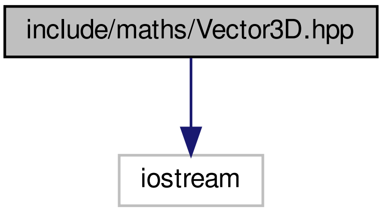
- Math

  Namespace for the math functions.

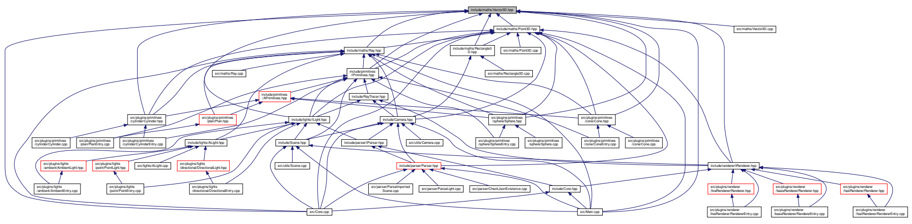
7.13 include/maths/Vector3D.hpp File Reference

`#include <iostream>`

Include dependency graph for Vector3D.hpp:



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



Data Structures

- class Math::Vector3D

Namespaces

- Math

  Namespace for the math functions.

Functions

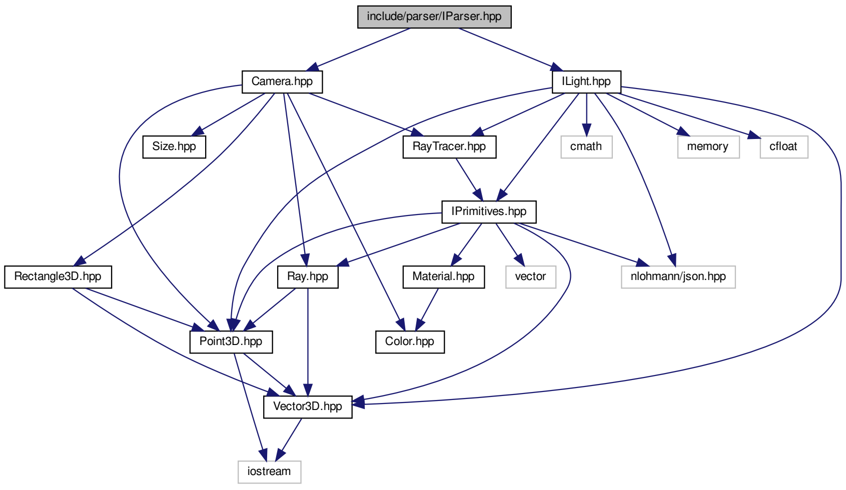
- std::ostream & Math::operator<< (std::ostream &os, const Vector3D &vect)

  Calculates the cross product of two vectors.

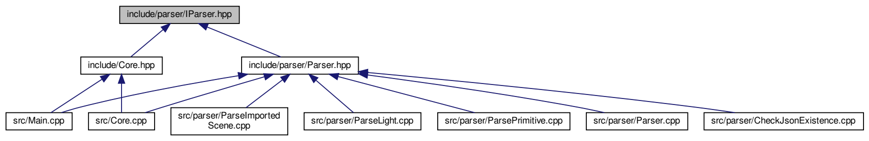
7.14 include/parser/IParser.hpp File Reference

```
#include "Camera.hpp"
#include "ILight.hpp"
```

Include dependency graph for IParser.hpp:



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


include/parser/IParser.hpp
include/Core.hpp
include/parser/Parser.hpp
src/Main.cpp
src/Core.cpp
src/parser/ParseImported Scene.cpp
src/parser/ParseLight.cpp
src/parser/ParsePrimitive.cpp
src/parser/Parser.cpp
src/parser/CheckJsonExistence.cpp

Data Structures

- class RayTracer::IParser

Namespaces

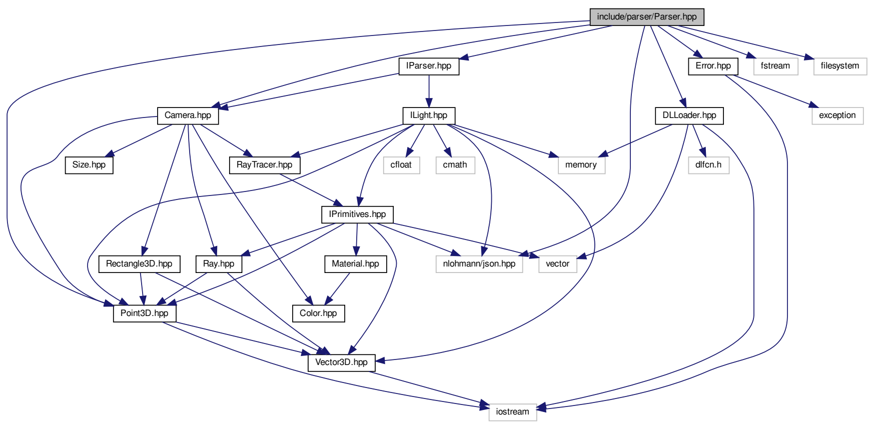
- RayTracer

  Namespace for the raytracer.

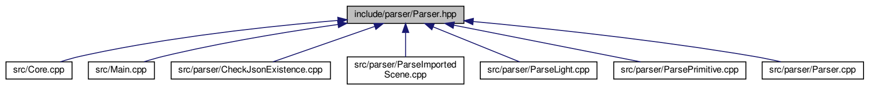
7.15 include/parser/Parser.hpp File Reference

```
#include "Camera.hpp"
#include "DLLoader.hpp"
#include "Error.hpp"
#include "IParser.hpp"
```

```
#include "Point3D.hpp"
#include "fstream"
#include <filesystem>
#include <nlohmann/json.hpp>
```
Include dependency graph for Parser.hpp:



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


include/parser/Parser.hpp
src/Core.cpp
src/Main.cpp
src/parser/CheckJsonExistence.cpp
src/parser/ParseImported Scene.cpp
src/parser/ParseLight.cpp
src/parser/ParsePrimitive.cpp
src/parser/Parser.cpp

Data Structures

- class RayTracer::Parser

  Class for the parser.

Namespaces

- RayTracer

  Namespace for the raytracer.

Typedefs

- using json = nlohmann::json

7.15.1 Typedef Documentation

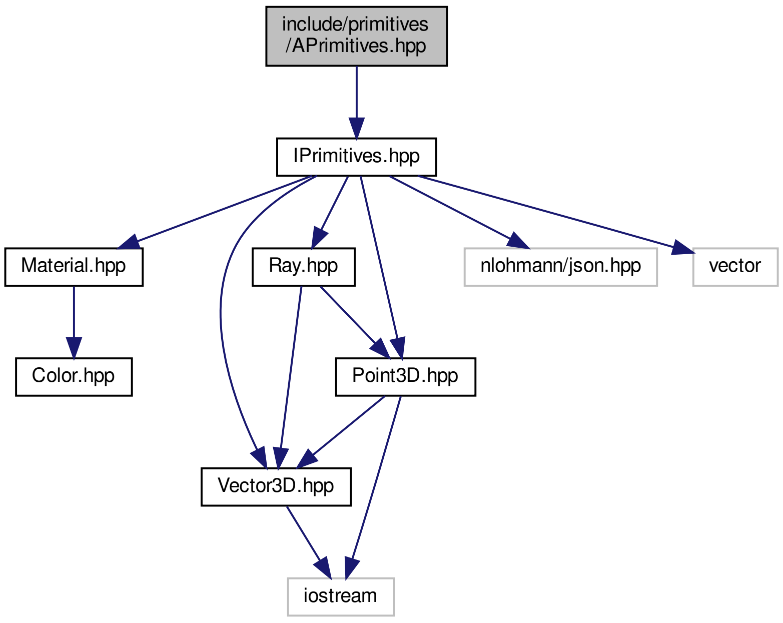
7.15.1.1 json

```
using json = nlohmann::json
```

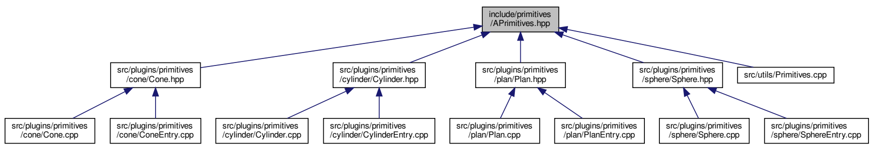
7.16 include/primitives/APrimitives.hpp File Reference

```
#include "IPrimitives.hpp"
```

Include dependency graph for APrimitives.hpp:



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



Data Structures

- class RayTracer::APrimitives

Namespaces

- RayTracer

    Namespace for the raytracer.

Macros

- #define PI_RAD 3.14159265 / 180

7.16.1 Macro Definition Documentation

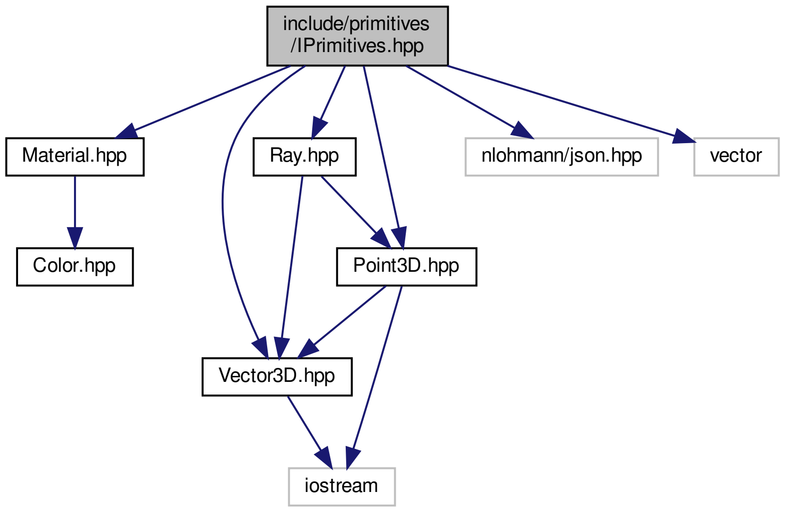
7.16.1.1 PI_RAD

```
#define PI_RAD 3.14159265 / 180
```

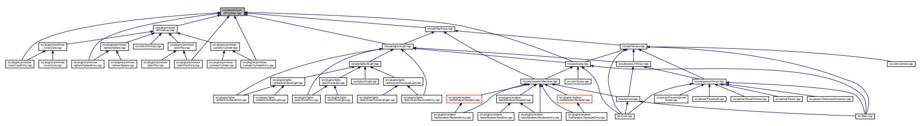
7.17 include/primitives/IPrimitives.hpp File Reference

```
#include "Material.hpp"
#include "Point3D.hpp"
#include "Ray.hpp"
#include "Vector3D.hpp"
#include <nlohmann/json.hpp>
#include <vector>
```

Include dependency graph for IPrimitives.hpp:



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



Data Structures

- class RayTracer::IPrimitives

Namespaces

- RayTracer

  Namespace for the raytracer.

Typedefs

- using json = nlohmann::json

7.17.1 Typedef Documentation

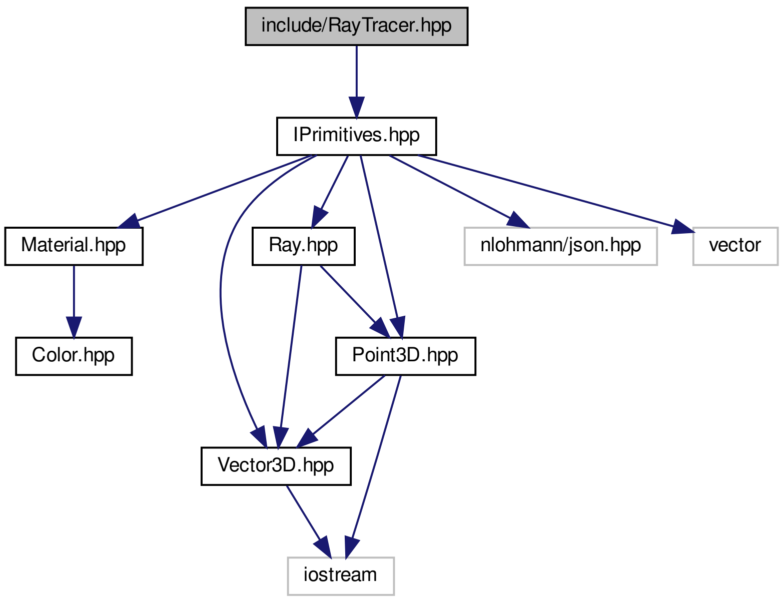
7.17.1.1 json

```
using json = nlohmann::json
```

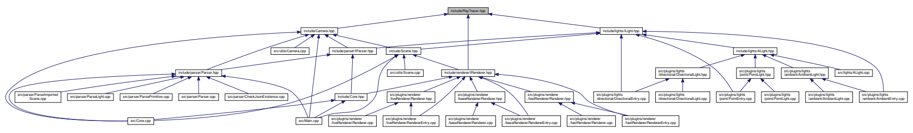
7.18 include/RayTracer.hpp File Reference

```
#include "IPrimitives.hpp"
```

Include dependency graph for RayTracer.hpp:



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



Data Structures

- struct RayTracer::intersection

    Struct for the intersection.

Namespaces

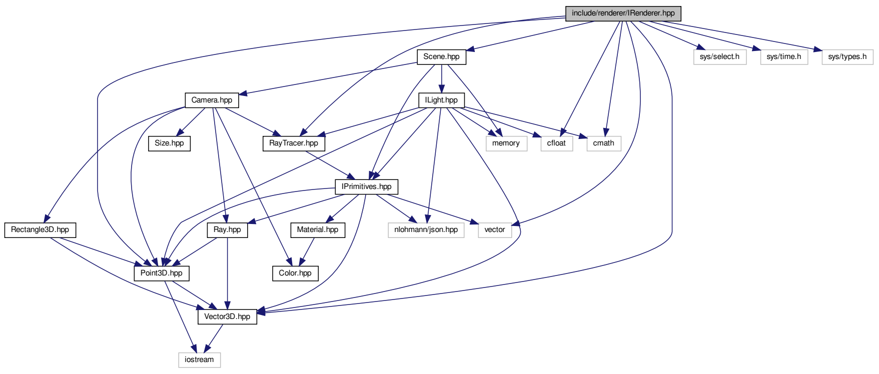
- RayTracer

    Namespace for the raytracer.

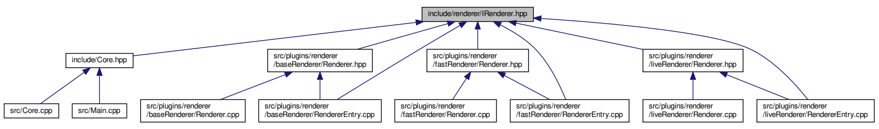
7.19 include/renderer/IRenderer.hpp File Reference

```
#include "Point3D.hpp"
#include "RayTracer.hpp"
#include "Scene.hpp"
#include "Vector3D.hpp"
#include <cfloat>
#include <cmath>
#include <sys/select.h>
#include <sys/time.h>
#include <sys/types.h>
#include <vector>
```

Include dependency graph for IRenderer.hpp:



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


include/renderer/IRenderer.hpp
include/Core.hpp
src/plugins/renderer /baseRenderer/Renderer.hpp
src/plugins/renderer /fastRenderer/Renderer.hpp
src/plugins/renderer /liveRenderer/Renderer.hpp
src/Core.cpp
src/Main.cpp
src/plugins/renderer /baseRenderer/Renderer.cpp
src/plugins/renderer /baseRenderer/RendererEntry.cpp
src/plugins/renderer /fastRenderer/Renderer.cpp
src/plugins/renderer /fastRenderer/RendererEntry.cpp
src/plugins/renderer /liveRenderer/Renderer.cpp
src/plugins/renderer /liveRenderer/RendererEntry.cpp

Data Structures

- class RayTracer::IRenderer

Namespaces

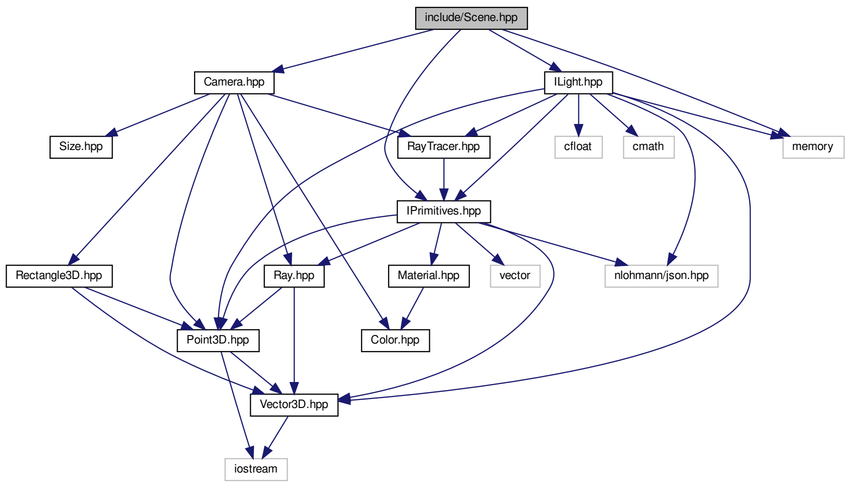
- RayTracer

  Namespace for the raytracer.

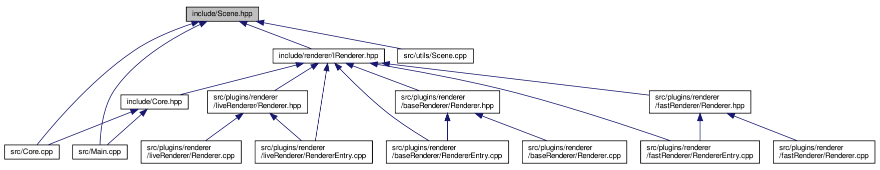
7.20 include/Scene.hpp File Reference

```
#include "Camera.hpp"
#include "IPrimitives.hpp"
#include "ILight.hpp"
#include <memory>
```

Include dependency graph for Scene.hpp:



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


include/Scene.hpp
include/renderer/IRenderer.hpp
src/utils/Scene.cpp
include/Core.hpp
src/plugins/renderer /liveRenderer/Renderer.hpp
src/plugins/renderer /baseRenderer/Renderer.hpp
src/plugins/renderer /fastRenderer/Renderer.hpp
src/Core.cpp
src/Main.cpp
src/plugins/renderer /liveRenderer/Renderer.cpp
src/plugins/renderer /liveRenderer/RendererEntry.cpp
src/plugins/renderer /baseRenderer/RendererEntry.cpp
src/plugins/renderer /baseRenderer/Renderer.cpp
src/plugins/renderer /fastRenderer/RendererEntry.cpp
src/plugins/renderer /fastRenderer/Renderer.cpp

Data Structures

- class RayTracer::Scene

  Class for the scene.

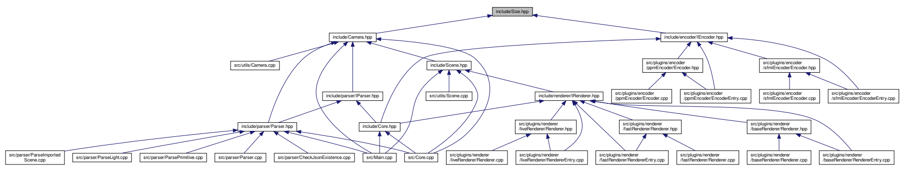
Namespaces

- [RayTracer](#)

  Namespace for the raytracer.

7.21 include/Size.hpp File Reference

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


include/Size.hpp
include/Camera.hpp
include/encoder/IEncoder.hpp
src/utils/Camera.cpp
include/Scene.hpp
src/plugins/encoder/ppmEncoder/Encoder.hpp
src/plugins/encoder/sfmlEncoder/Encoder.hpp
include/parser/IParser.hpp
src/utils/Scene.cpp
include/renderer/IRenderer.hpp
src/plugins/encoder/ppmEncoder/Encoder.cpp
src/plugins/encoder/ppmEncoder/EncoderEntry.cpp
src/plugins/encoder/sfmlEncoder/Encoder.cpp
src/plugins/encoder/sfmlEncoder/EncoderEntry.cpp
include/parser/Parser.hpp
include/Core.hpp
src/plugins/renderer/liveRenderer/Renderer.hpp
src/plugins/renderer/fastRenderer/Renderer.hpp
src/plugins/renderer/baseRenderer/Renderer.hpp
src/parser/ParseImported Scene.cpp
src/parser/ParseLight.cpp
src/parser/ParsePrimitive.cpp
src/parser/Parser.cpp
src/parser/CheckJsonExistence.cpp
src/Main.cpp
src/Core.cpp
src/plugins/renderer/liveRenderer/Renderer.cpp
src/plugins/renderer/liveRenderer/RendererEntry.cpp
src/plugins/renderer/fastRenderer/RendererEntry.cpp
src/plugins/renderer/fastRenderer/Renderer.cpp
src/plugins/renderer/baseRenderer/Renderer.cpp
src/plugins/renderer/baseRenderer/RendererEntry.cpp

Data Structures

- struct [RayTracer::imageSize](#)

Namespaces

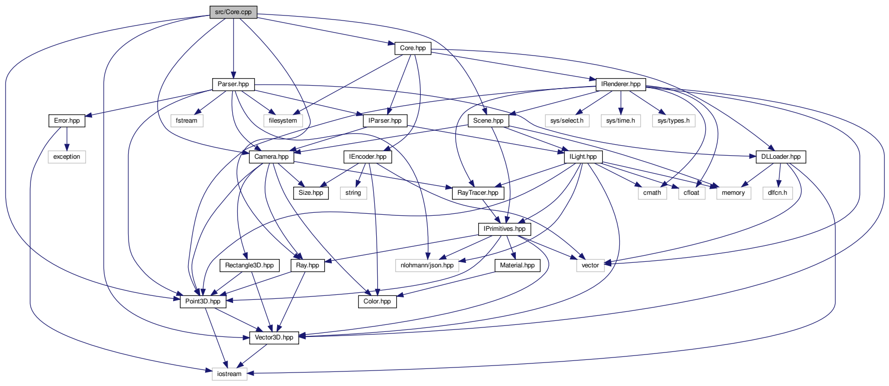
- [RayTracer](#)

  Namespace for the raytracer.

7.22 src/Core.cpp File Reference

```
#include "Core.hpp"
#include "Camera.hpp"
#include "Parser.hpp"
#include "Point3D.hpp"
#include "Ray.hpp"
#include "Scene.hpp"
#include "Vector3D.hpp"
```

Include dependency graph for Core.cpp:



Namespaces

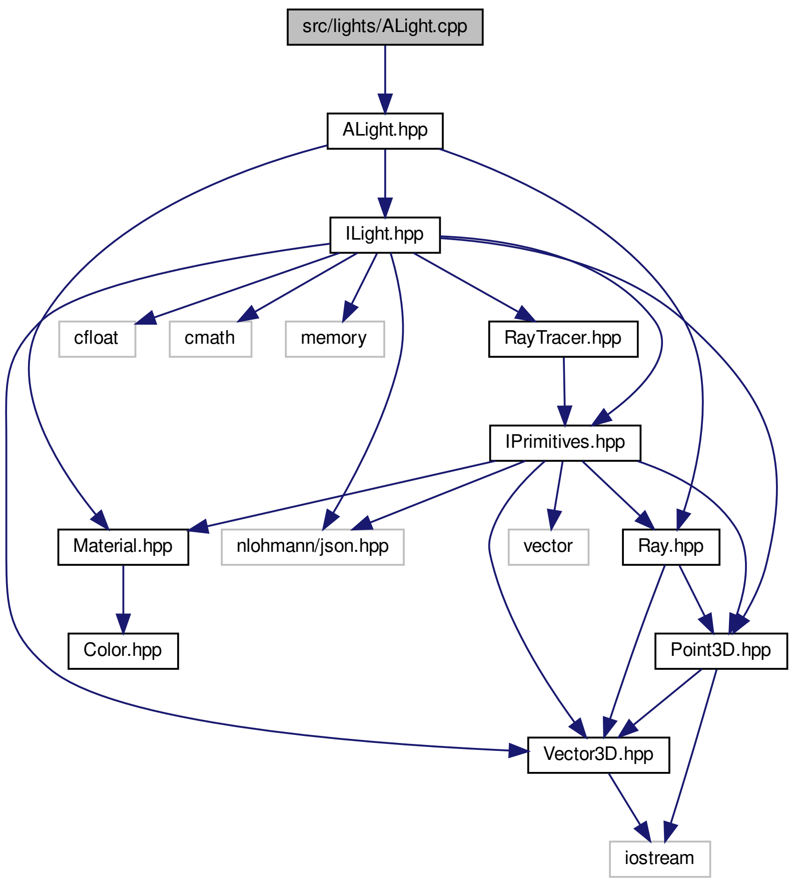
- RayTracer

  Namespace for the raytracer.

7.23 src/lights/ALight.cpp File Reference

```
#include "ALight.hpp"
```

Include dependency graph for ALight.cpp:



Namespaces

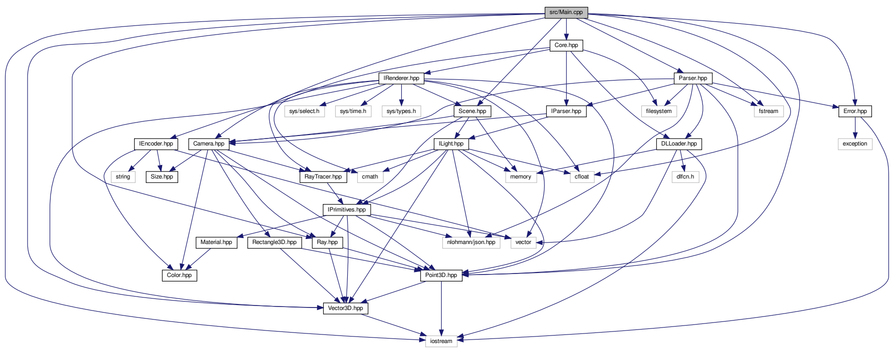
- RayTracer

  Namespace for the raytracer.

7.24 src/Main.cpp File Reference

```
#include "Camera.hpp"
#include "Core.hpp"
#include "Error.hpp"
#include "Parser.hpp"
#include "Point3D.hpp"
#include "Ray.hpp"
#include "Scene.hpp"
#include "Vector3D.hpp"
#include <cfloat>
#include <fstream>
#include <iostream>
```

Include dependency graph for Main.cpp:



Functions

- int checkArgs (int ac, const char ∗av[ ])
- int main (const int ac, const char ∗av[ ])

7.24.1 Function Documentation

7.24.1.1 checkArgs()

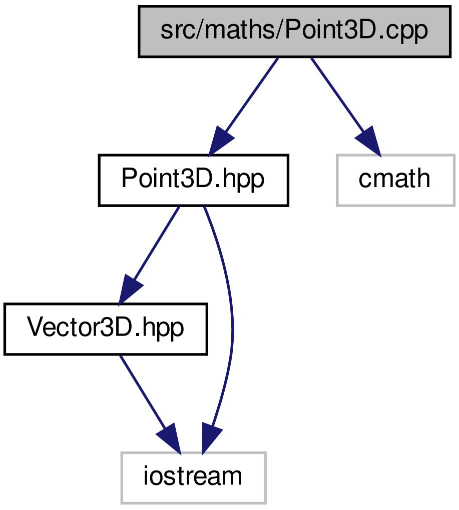
```
int checkArgs (
            int ac,
            const char * av[ ] )
```

7.24.1.2 main()

```
int main (
            const int ac,
            const char * av[ ] )
```

7.25 src/maths/Point3D.cpp File Reference

```
#include "Point3D.hpp"
#include <cmath>
```
Include dependency graph for Point3D.cpp:



Namespaces

- Math

  Namespace for the math functions.

Functions

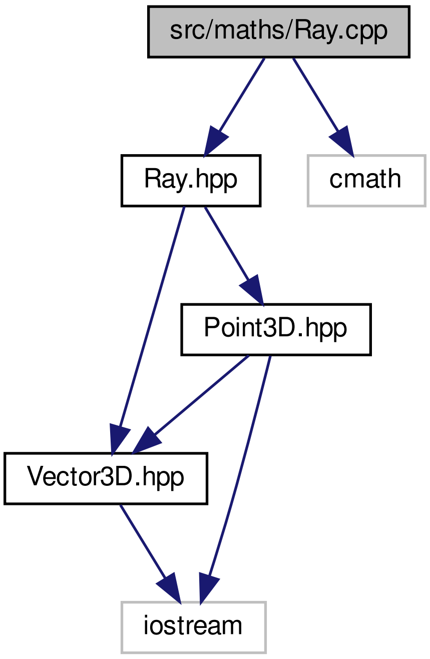
- std::ostream & Math::operator<< (std::ostream &os, const Point3D &vect)

  Outputs a human-readable representation of the given point to the given output stream.

7.26 src/maths/Ray.cpp File Reference

```
#include "Ray.hpp"
#include <cmath>
```

Include dependency graph for Ray.cpp:



Namespaces

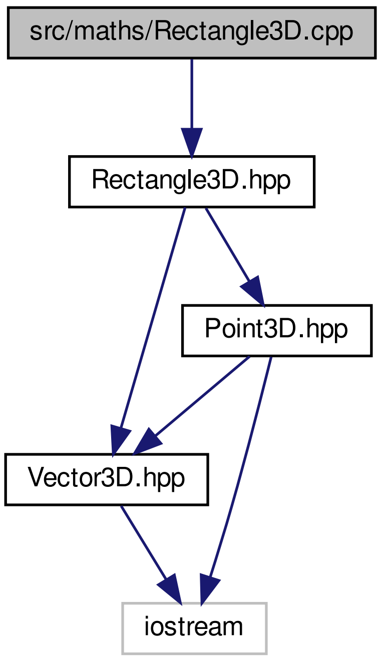
- RayTracer

  Namespace for the raytracer.

7.27 src/maths/Rectangle3D.cpp File Reference

```
#include "Rectangle3D.hpp"
```

Include dependency graph for Rectangle3D.cpp:



Namespaces

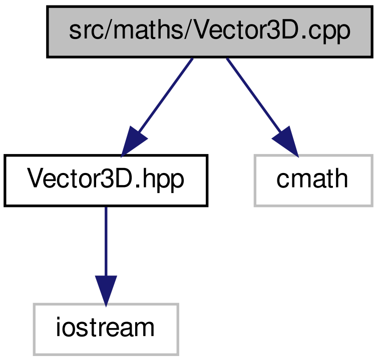
- Math

  Namespace for the math functions.

7.28 src/maths/Vector3D.cpp File Reference

```
#include "Vector3D.hpp"
#include <cmath>
```

Include dependency graph for Vector3D.cpp:



Namespaces

- Math

  Namespace for the math functions.

Functions

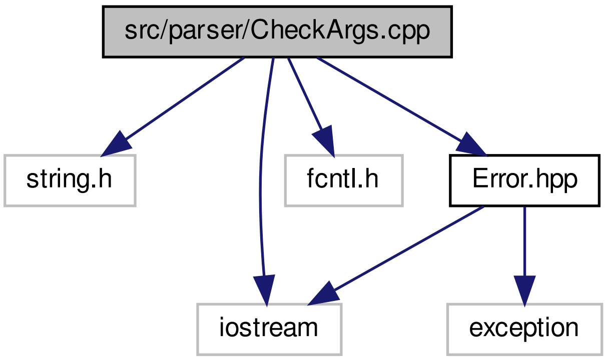
- std::ostream & Math::operator<< (std::ostream &os, const Vector3D &vect)

  Calculates the cross product of two vectors.

7.29 src/parser/CheckArgs.cpp File Reference

```
#include <string.h>
#include <iostream>
#include <fcntl.h>
#include "Error.hpp"
```

Include dependency graph for CheckArgs.cpp:



Functions

- void displayUsage ()
- int checkArgs (int ac, const char ∗av[ ])

7.29.1 Function Documentation

7.29.1.1 checkArgs()

```
int checkArgs (
             int ac,
             const char * av[ ] )
```

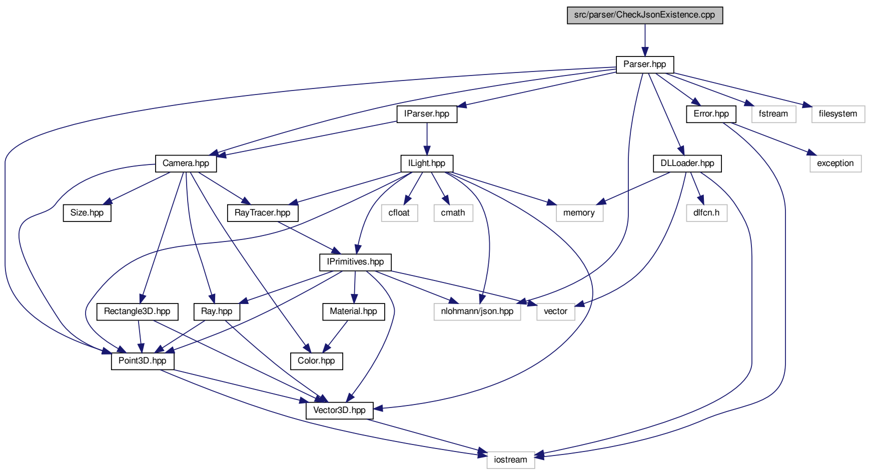
7.29.1.2 displayUsage()

```
void displayUsage ( )
```

7.30 src/parser/CheckJsonExistence.cpp File Reference

```
#include "Parser.hpp"
```

Include dependency graph for CheckJsonExistence.cpp:



Namespaces

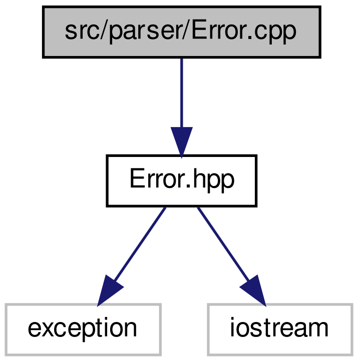
- RayTracer

    Namespace for the raytracer.

7.31 src/parser/Error.cpp File Reference

```
#include "Error.hpp"
```

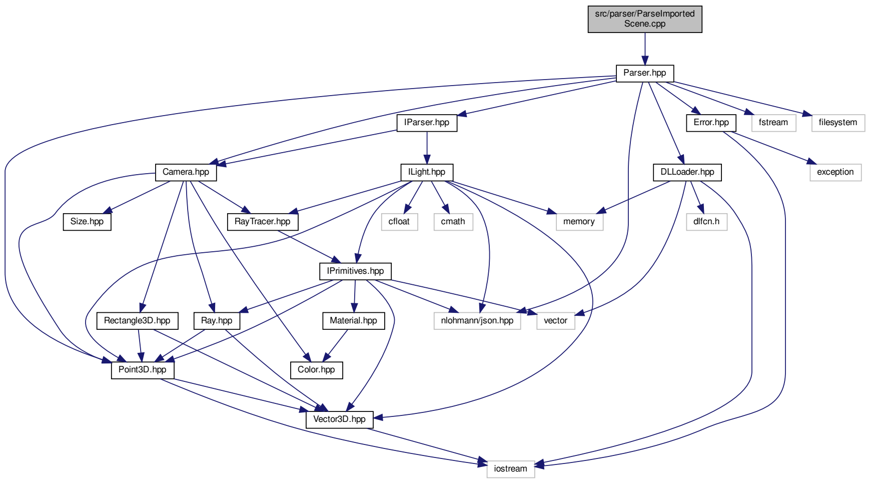
Include dependency graph for Error.cpp:



7.32 src/parser/ParseImportedScene.cpp File Reference

```
#include "Parser.hpp"
```

Include dependency graph for ParseImportedScene.cpp:



Namespaces

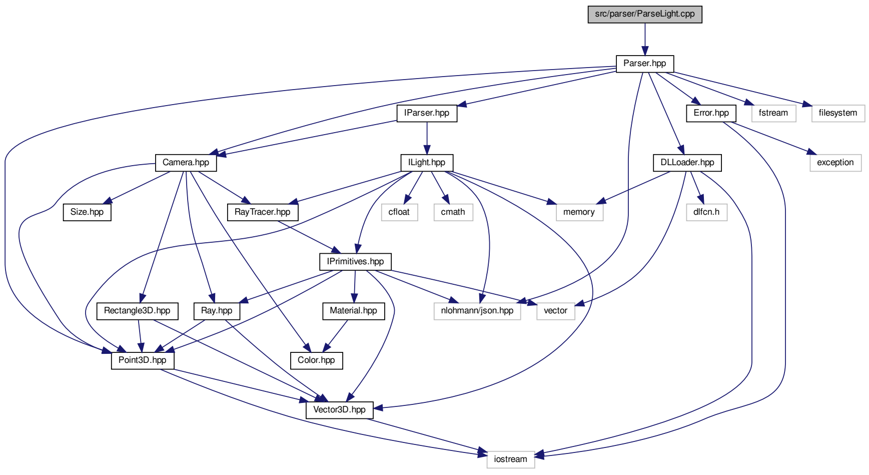
- RayTracer

  Namespace for the raytracer.

7.33 src/parser/ParseLight.cpp File Reference

```
#include "Parser.hpp"
```

Include dependency graph for ParseLight.cpp:



Namespaces

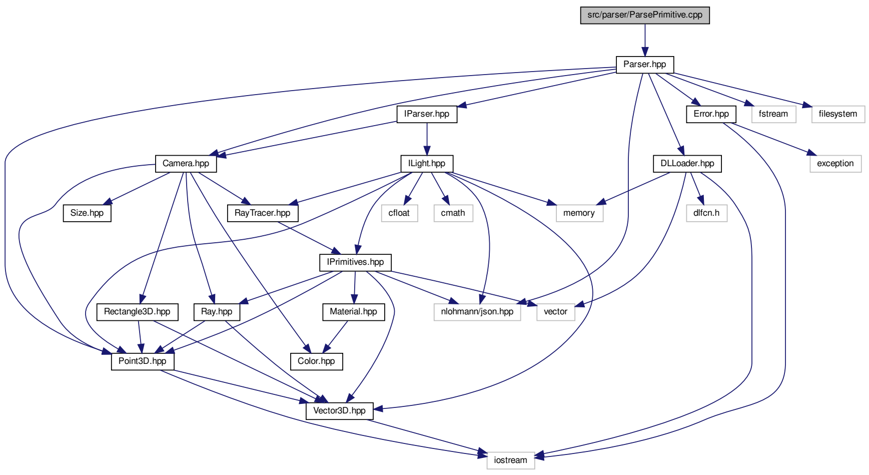
- RayTracer

  Namespace for the raytracer.

7.34 src/parser/ParsePrimitive.cpp File Reference

```
#include "Parser.hpp"
```

Include dependency graph for ParsePrimitive.cpp:



Namespaces

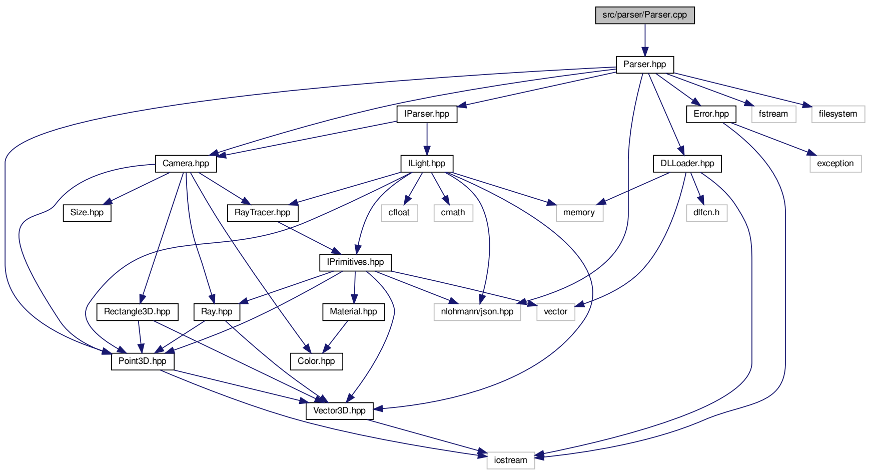
- RayTracer

  Namespace for the raytracer.

7.35 src/parser/Parser.cpp File Reference

```
#include "Parser.hpp"
```

Include dependency graph for Parser.cpp:



Namespaces

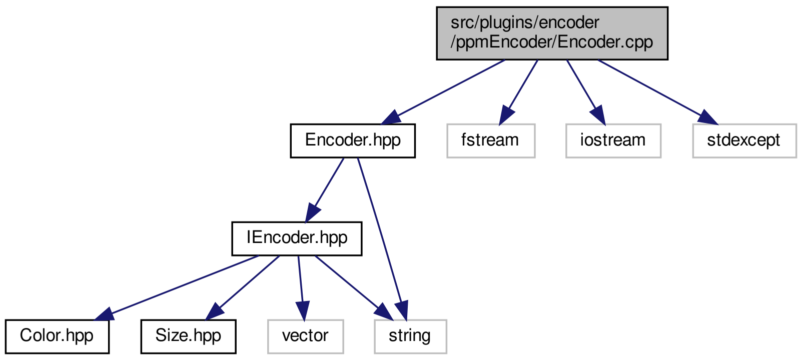
- RayTracer

  Namespace for the raytracer.

7.36 src/plugins/encoder/ppmEncoder/Encoder.cpp File Reference

```
#include "Encoder.hpp"
#include <fstream>
#include <iostream>
#include <stdexcept>
```

Include dependency graph for Encoder.cpp:



Namespaces

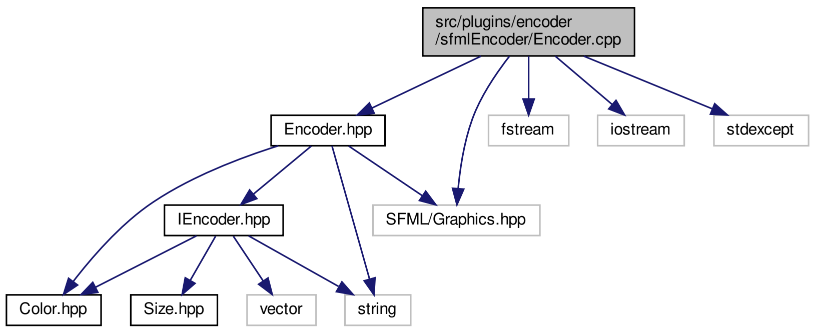
- RayTracer

  Namespace for the raytracer.

7.37 src/plugins/encoder/sfmlEncoder/Encoder.cpp File Reference

```
#include "Encoder.hpp"
#include "SFML/Graphics.hpp"
#include <fstream>
#include <iostream>
#include <stdexcept>
```

Include dependency graph for Encoder.cpp:



Namespaces

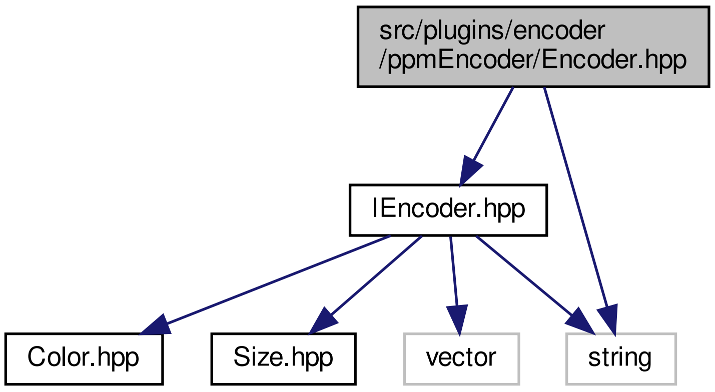
- RayTracer

  Namespace for the raytracer.

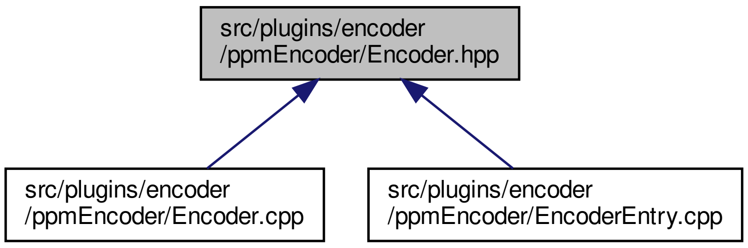
7.38 src/plugins/encoder/ppmEncoder/Encoder.hpp File Reference

```
#include "IEncoder.hpp"
#include <string>
```

Include dependency graph for Encoder.hpp:



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



Data Structures

- class RayTracer::Encoder

  Encoder class.

Namespaces

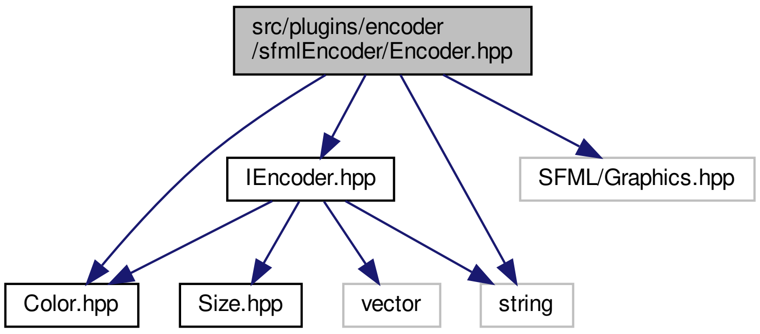
- RayTracer

  Namespace for the raytracer.

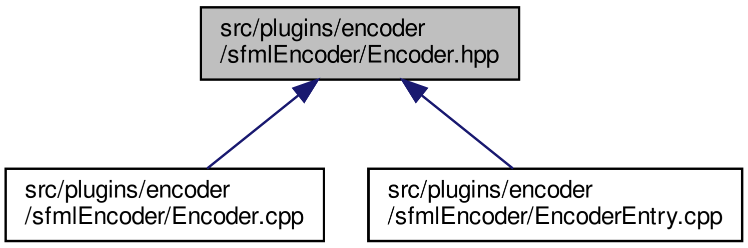
7.39 src/plugins/encoder/sfmlEncoder/Encoder.hpp File Reference

```
#include "Color.hpp"
#include "IEncoder.hpp"
#include <SFML/Graphics.hpp>
#include <string>
```

Include dependency graph for Encoder.hpp:



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



Data Structures

- class RayTracer::SfmlEncoder
- struct RayTracer::SfmlEncoder::Image

Namespaces

- RayTracer

    Namespace for the raytracer.

Macros

- #define FRAME_RATE_LIMIT 60
- #define MAX_VALUE 255
- #define BYTE_OF_RGBA_FORMAT 4
- #define HEADER_MAGIC_NUMBER "P3"

7.39.1 Macro Definition Documentation

7.39.1.1 BYTE_OF_RGBA_FORMAT

```
#define BYTE_OF_RGBA_FORMAT 4
```

7.39.1.2 FRAME_RATE_LIMIT

```
#define FRAME_RATE_LIMIT 60
```

7.39.1.3 HEADER_MAGIC_NUMBER

```
#define HEADER_MAGIC_NUMBER "P3"
```

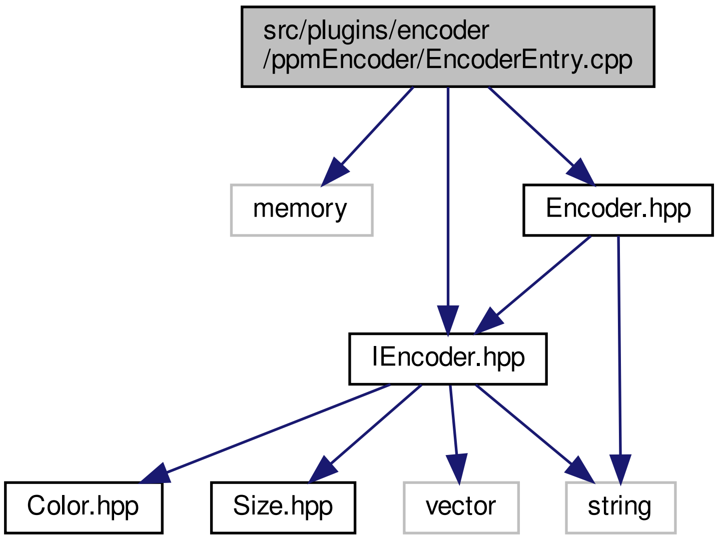
7.39.1.4 MAX_VALUE

```
#define MAX_VALUE 255
```

7.40 src/plugins/encoder/ppmEncoder/EncoderEntry.cpp File Reference

```
#include <memory>
#include "IEncoder.hpp"
#include "Encoder.hpp"
```

Include dependency graph for EncoderEntry.cpp:



Functions

- std::unique_ptr< RayTracer::IEncoder > entryPoint ()

7.40.1 Function Documentation

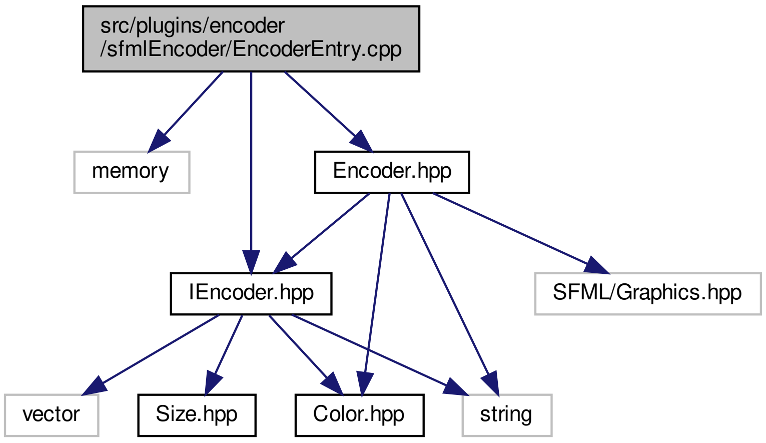
7.40.1.1 entryPoint()

```
std::unique_ptr<RayTracer::IEncoder> entryPoint ( )
```

7.41 src/plugins/encoder/sfmlEncoder/EncoderEntry.cpp File Reference

```
#include <memory>
#include "IEncoder.hpp"
#include "Encoder.hpp"
```

Include dependency graph for EncoderEntry.cpp:



Functions

- std::unique_ptr< RayTracer::IEncoder > entryPoint ()

7.41.1 Function Documentation

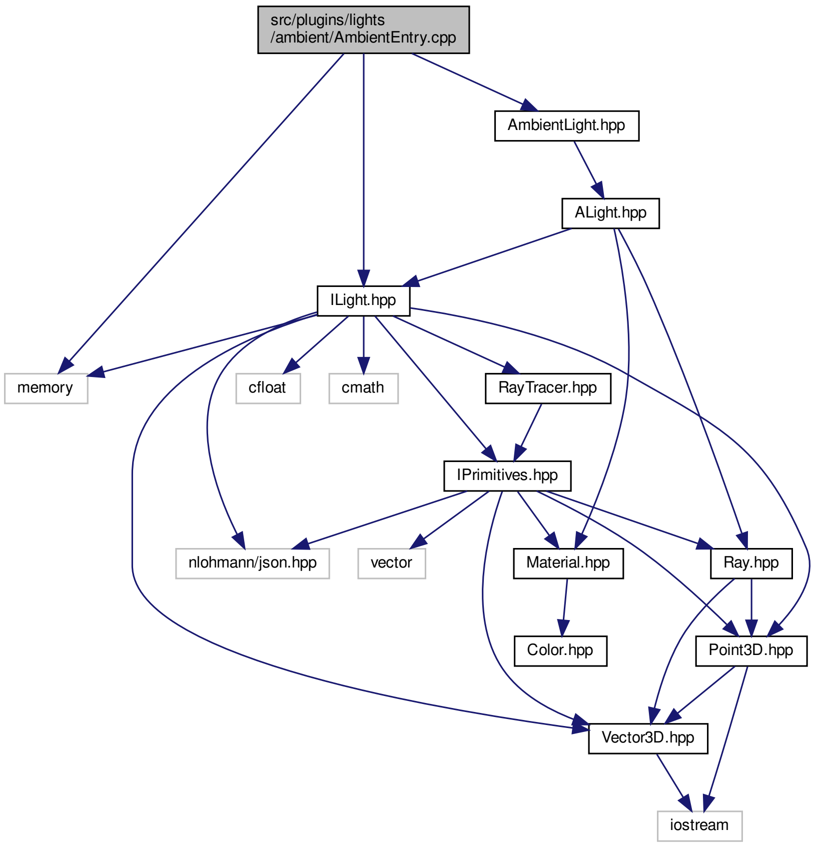
7.41.1.1 entryPoint()

```
std::unique_ptr<RayTracer::IEncoder> entryPoint ( )
```

7.42 src/plugins/lights/ambient/AmbientEntry.cpp File Reference

```
#include <memory>
#include "ILight.hpp"
#include "AmbientLight.hpp"
```

Include dependency graph for AmbientEntry.cpp:



Functions

- std::unique_ptr< RayTracer::ILight > entryPoint ()

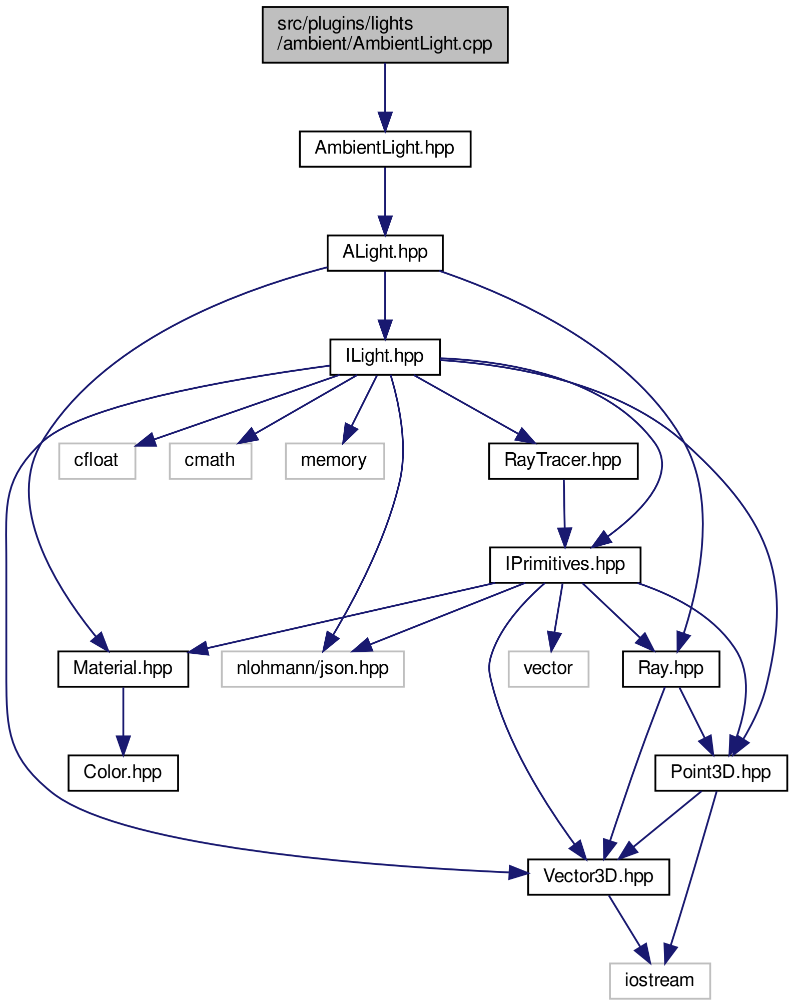
7.42.1 Function Documentation

7.42.1.1 entryPoint()

```
std::unique_ptr<RayTracer::ILight> entryPoint ( )
```

7.43 src/plugins/lights/ambient/AmbientLight.cpp File Reference

```
#include "AmbientLight.hpp"
```
Include dependency graph for AmbientLight.cpp:



Namespaces

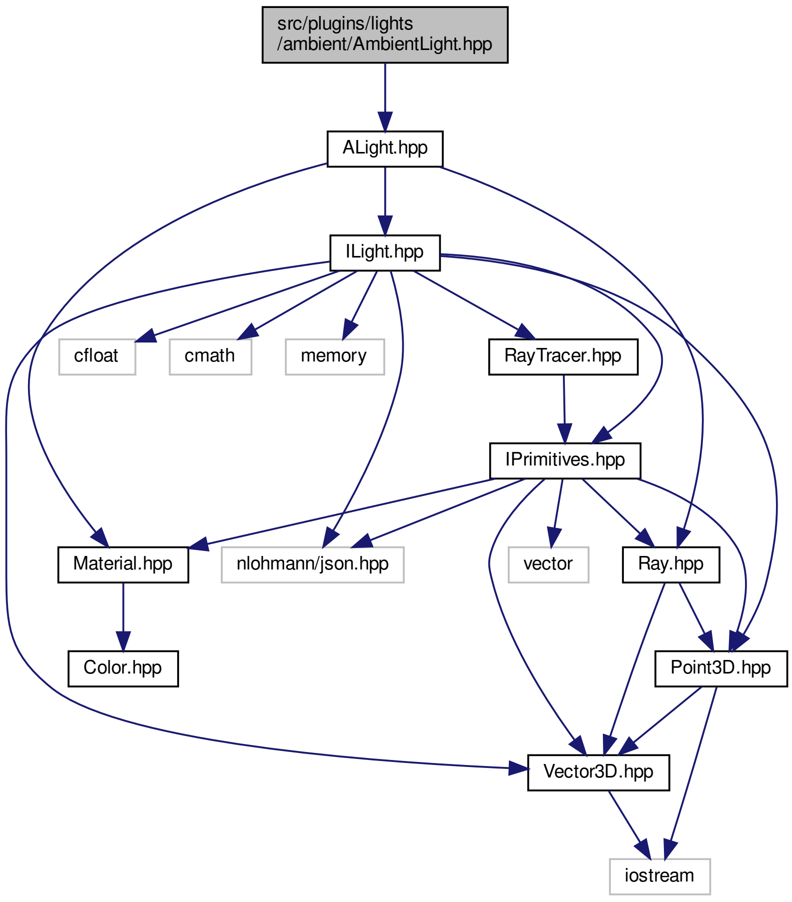
- RayTracer

    Namespace for the raytracer.

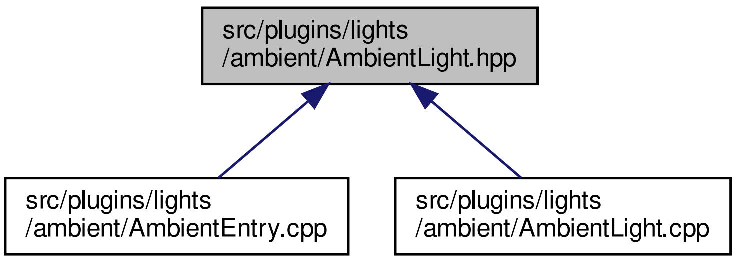
7.44 src/plugins/lights/ambient/AmbientLight.hpp File Reference

```
#include "ALight.hpp"
```

Include dependency graph for AmbientLight.hpp:



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


src/plugins/lights
/ambient/AmbientLight.hpp
src/plugins/lights
/ambient/AmbientEntry.cpp
src/plugins/lights
/ambient/AmbientLight.cpp

Data Structures

- class RayTracer::AmbientLight

Namespaces

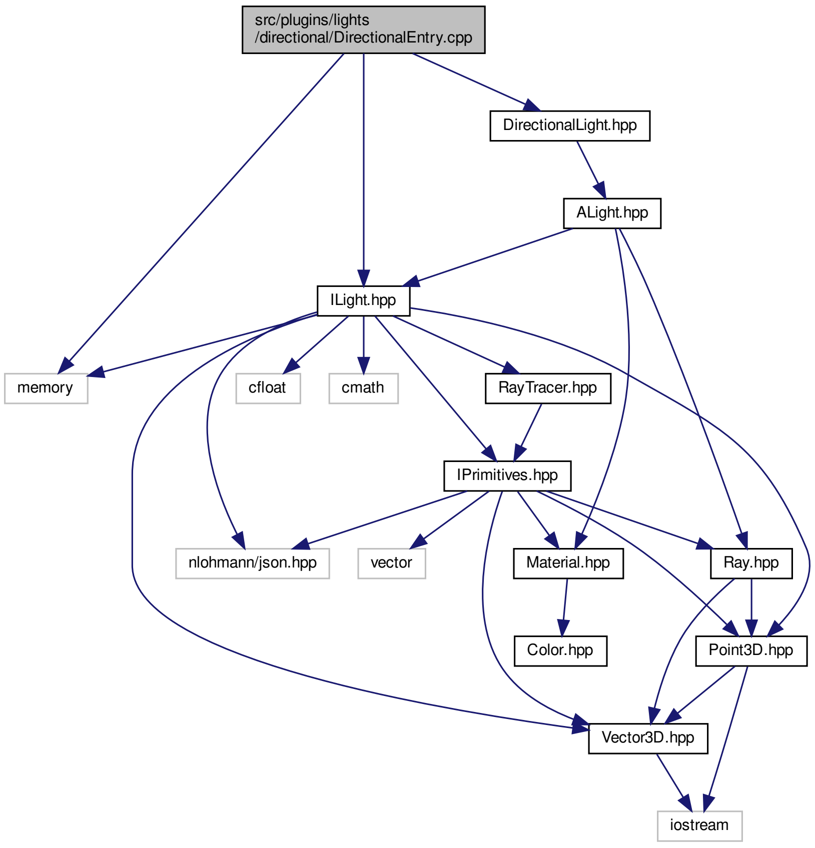
- RayTracer

  Namespace for the raytracer.

7.45 src/plugins/lights/directional/DirectionalEntry.cpp File Reference

```
#include <memory>
#include "ILight.hpp"
#include "DirectionalLight.hpp"
```

Include dependency graph for DirectionalEntry.cpp:



Functions

- std::unique_ptr< RayTracer::ILight > entryPoint ()

7.45.1 Function Documentation

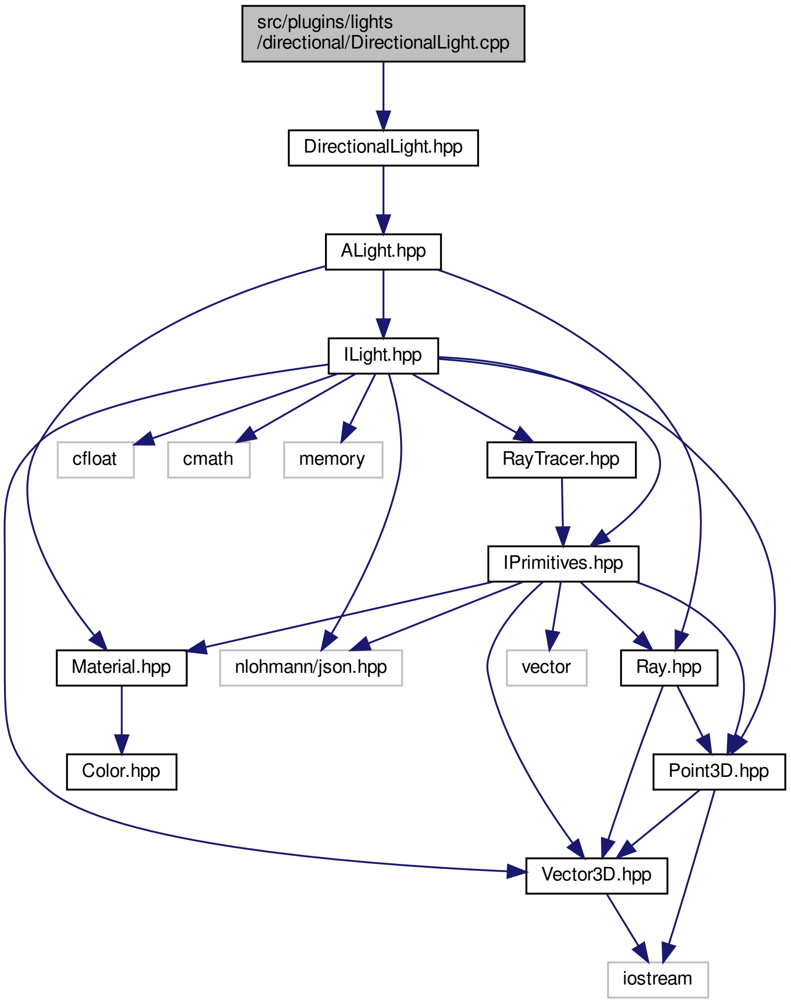
7.45.1.1 entryPoint()

```
std::unique_ptr<RayTracer::ILight> entryPoint ( )
```

7.46 src/plugins/lights/directional/DirectionalLight.cpp File Reference

```
#include "DirectionalLight.hpp"
```

Include dependency graph for DirectionalLight.cpp:



Namespaces

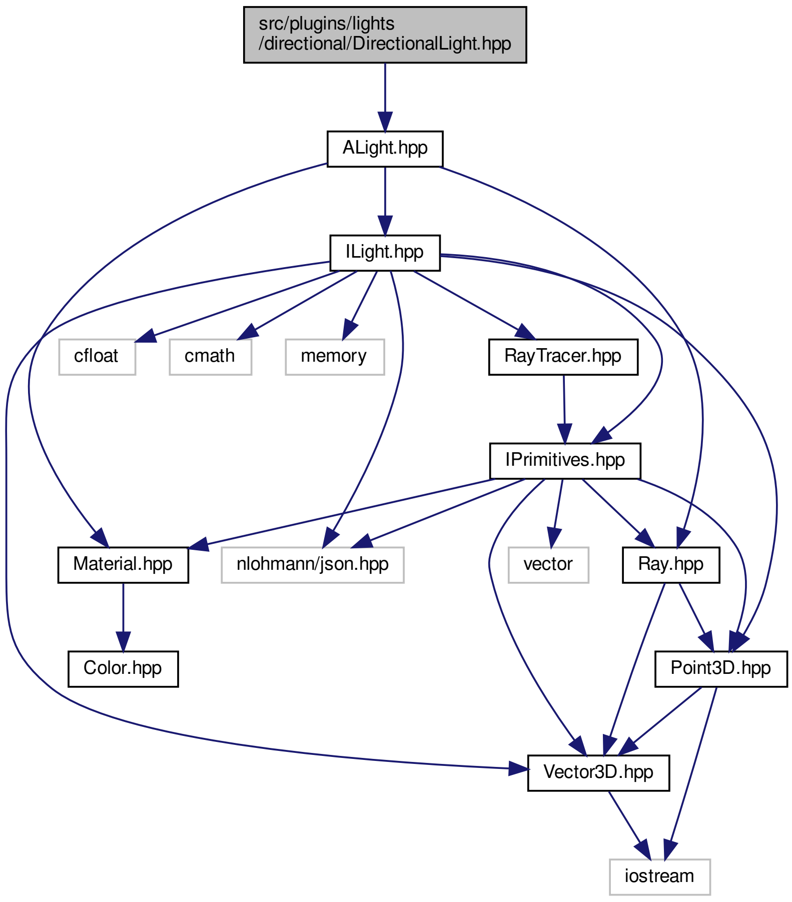
- RayTracer

  Namespace for the raytracer.

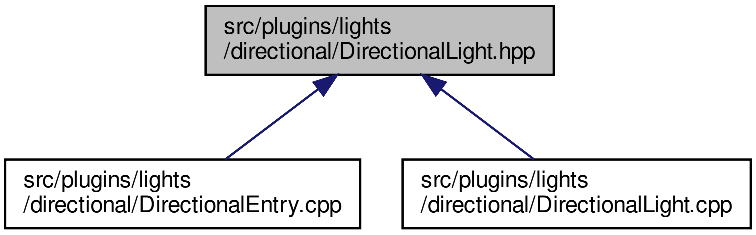
7.47 src/plugins/lights/directional/DirectionalLight.hpp File Reference

```
#include "ALight.hpp"
```

Include dependency graph for DirectionalLight.hpp:



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


src/plugins/lights
/directional/DirectionalLight.hpp
src/plugins/lights
/directional/DirectionalEntry.cpp
src/plugins/lights
/directional/DirectionalLight.cpp

Data Structures

- class RayTracer::DirectionalLight

Namespaces

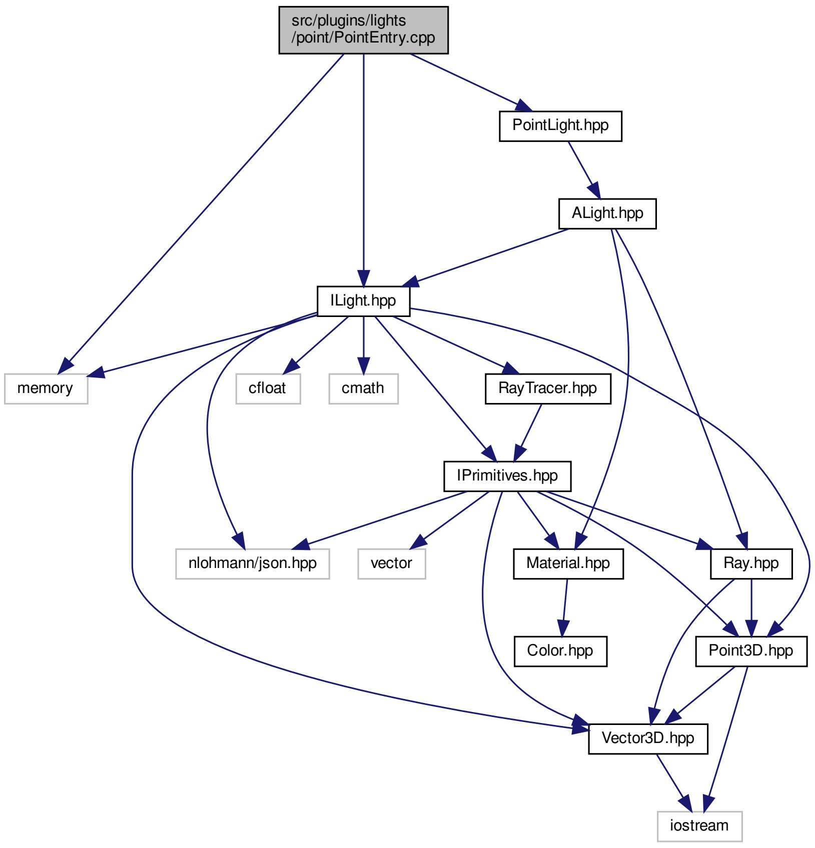
- RayTracer

  Namespace for the raytracer.

7.48 src/plugins/lights/point/PointEntry.cpp File Reference

```
#include <memory>
#include "ILight.hpp"
#include "PointLight.hpp"
```

Include dependency graph for PointEntry.cpp:



Functions

- std::unique_ptr< RayTracer::ILight > entryPoint ()

7.48.1 Function Documentation

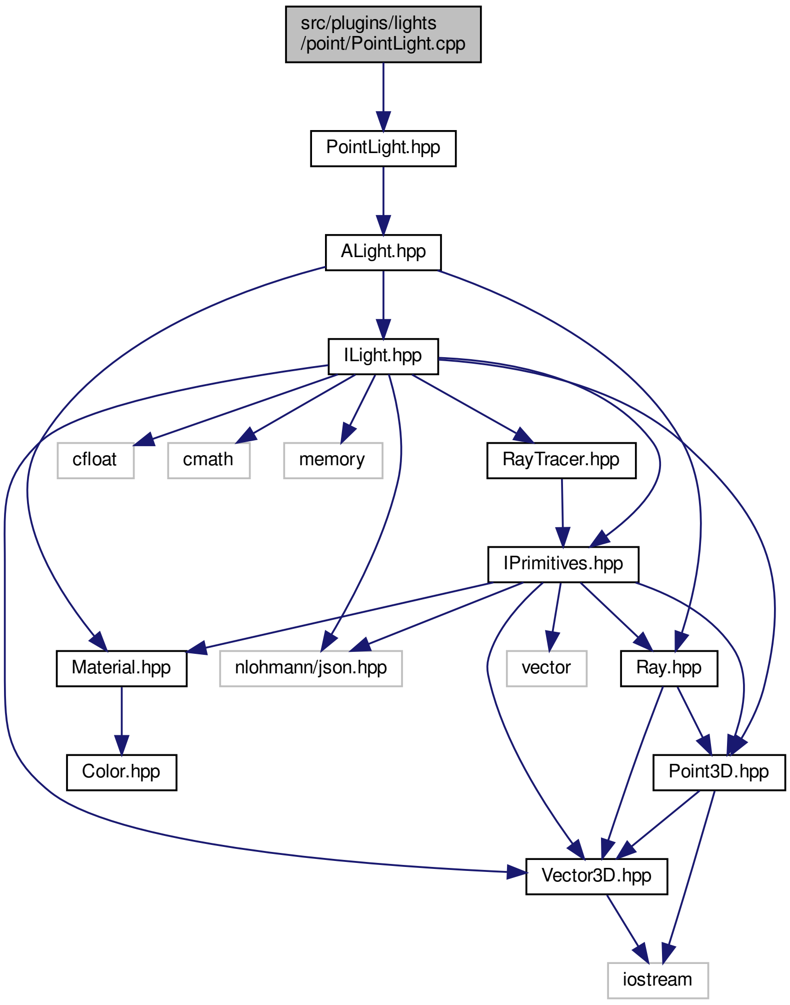
7.48.1.1 entryPoint()

```
std::unique_ptr<RayTracer::ILight> entryPoint ( )
```

7.49 src/plugins/lights/point/PointLight.cpp File Reference

```
#include "PointLight.hpp"
```

Include dependency graph for PointLight.cpp:



Namespaces

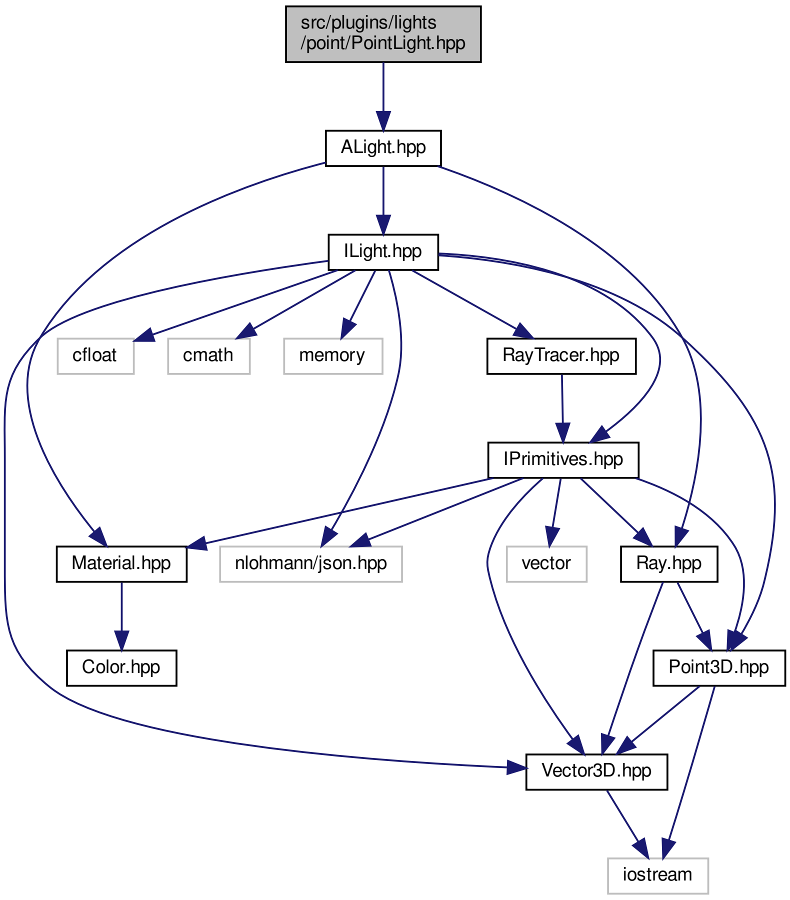
- RayTracer

  Namespace for the raytracer.

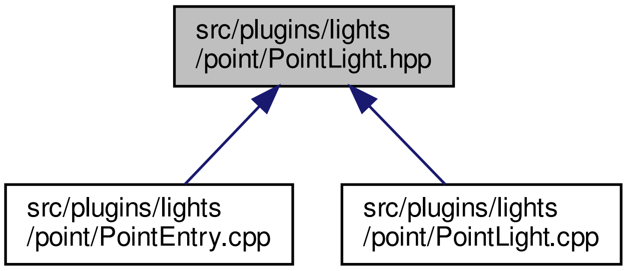
7.50 src/plugins/lights/point/PointLight.hpp File Reference

```
#include "ALight.hpp"
```

Include dependency graph for PointLight.hpp:



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



Data Structures

- class RayTracer::PointLight

Namespaces

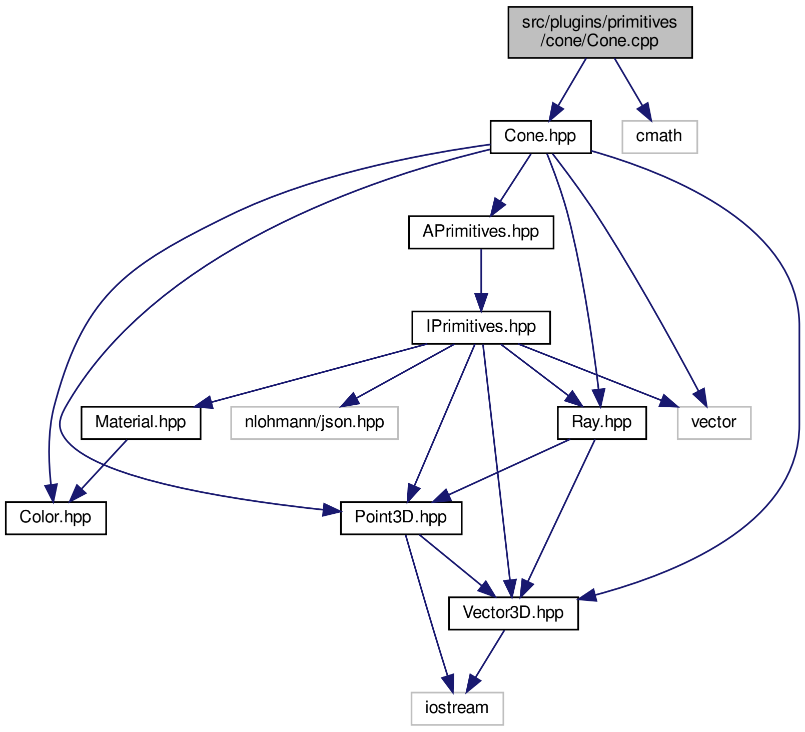
- RayTracer

  Namespace for the raytracer.

7.51 src/plugins/primitives/cone/Cone.cpp File Reference

```
#include "Cone.hpp"
#include <cmath>
```

Include dependency graph for Cone.cpp:



Namespaces

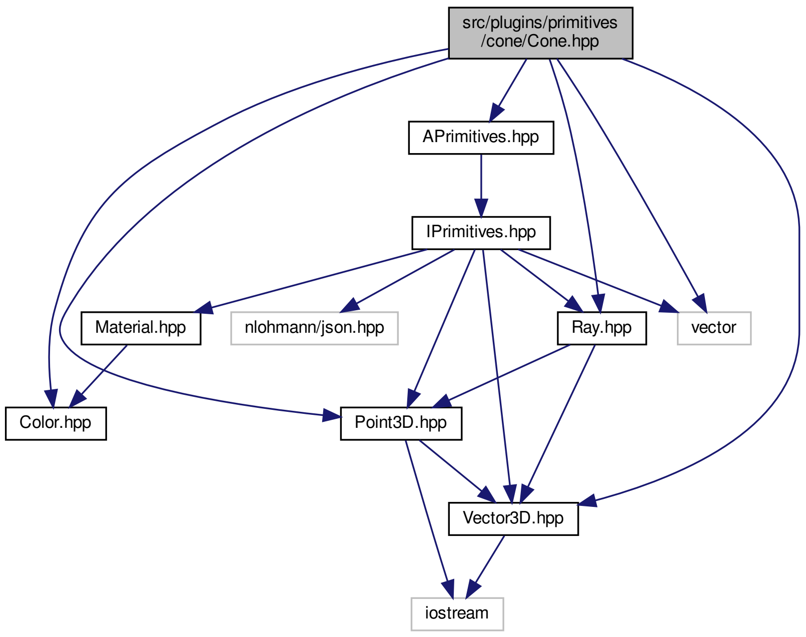
- RayTracer

  Namespace for the raytracer.

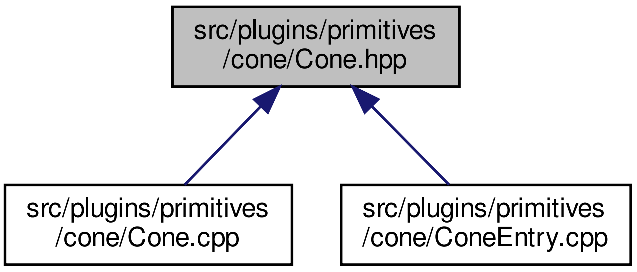
7.52 src/plugins/primitives/cone/Cone.hpp File Reference

```
#include "APrimitives.hpp"
#include "Color.hpp"
#include "Point3D.hpp"
#include "Ray.hpp"
#include "Vector3D.hpp"
#include <vector>
```

Include dependency graph for Cone.hpp:



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



Data Structures

- class RayTracer::Cone

Namespaces

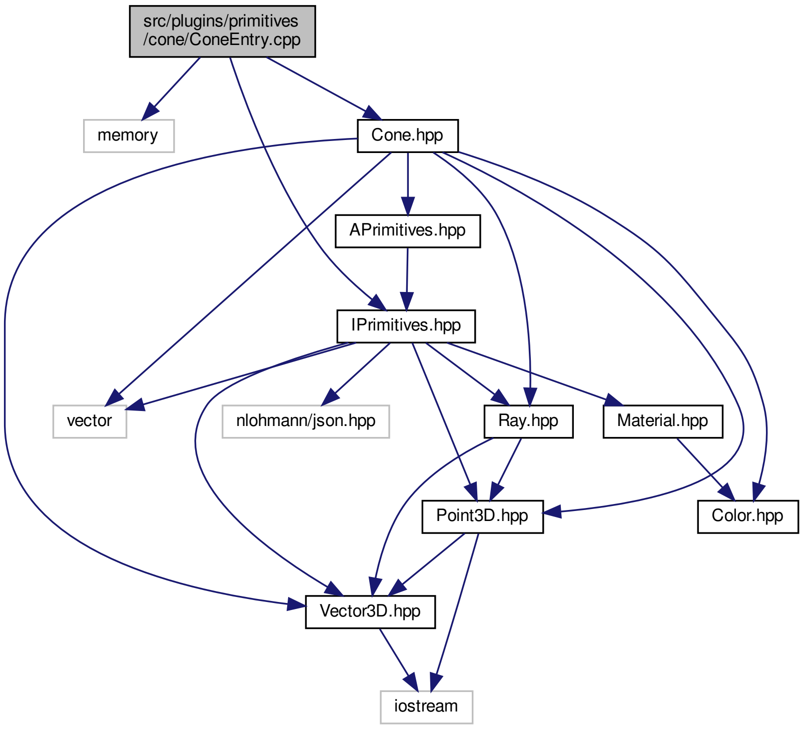
- RayTracer

  Namespace for the raytracer.

7.53 src/plugins/primitives/cone/ConeEntry.cpp File Reference

```
#include <memory>
#include "IPrimitives.hpp"
#include "Cone.hpp"
```

Include dependency graph for ConeEntry.cpp:



Functions

- std::unique_ptr< RayTracer::IPrimitives > entryPoint ()

7.53.1 Function Documentation

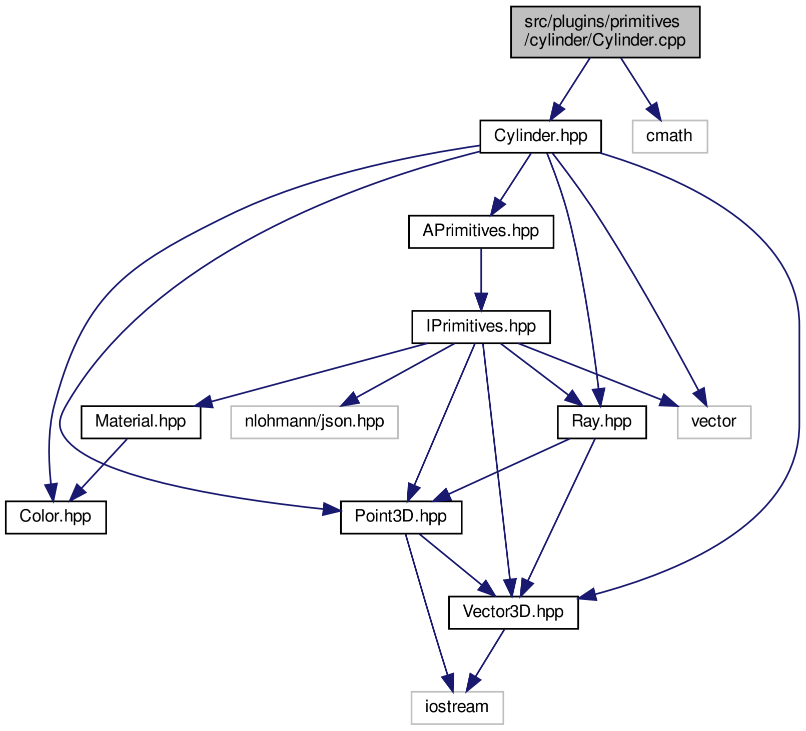
7.53.1.1 entryPoint()

```
std::unique_ptr<RayTracer::IPrimitives> entryPoint ( )
```

7.54 src/plugins/primitives/cylinder/Cylinder.cpp File Reference

```
#include "Cylinder.hpp"
#include <cmath>
```

Include dependency graph for Cylinder.cpp:



Namespaces

- RayTracer

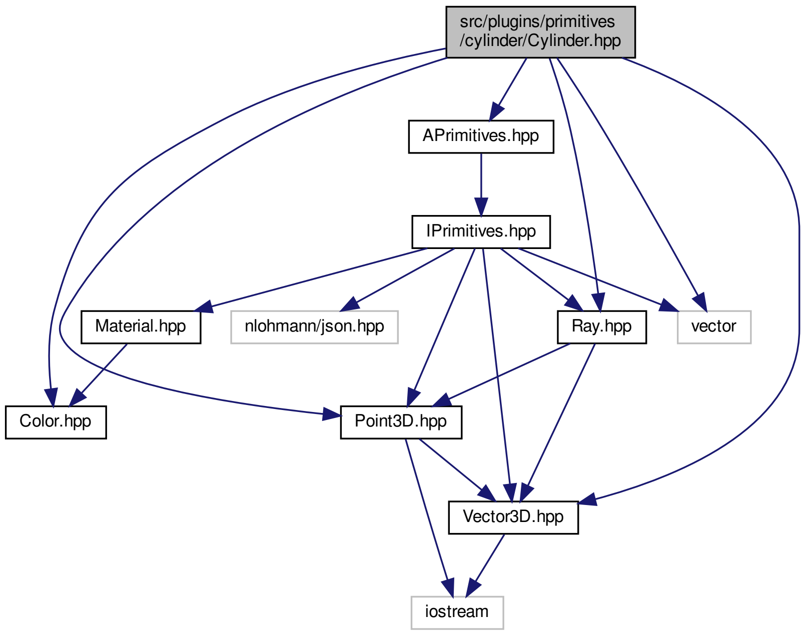
  Namespace for the raytracer.

7.55 src/plugins/primitives/cylinder/Cylinder.hpp File Reference

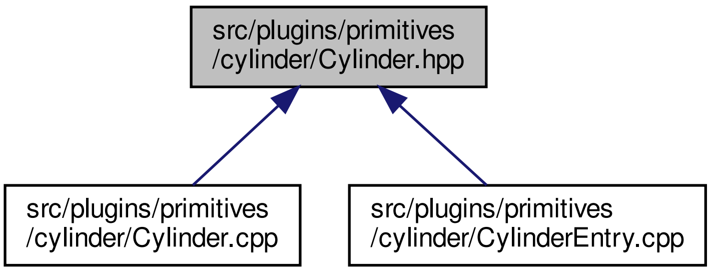
```
#include "APrimitives.hpp"
#include "Color.hpp"
#include "Point3D.hpp"
#include "Ray.hpp"
#include "Vector3D.hpp"
```

```
#include <vector>
```

Include dependency graph for Cylinder.hpp:



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



Data Structures

- class RayTracer::Cylinder

Namespaces

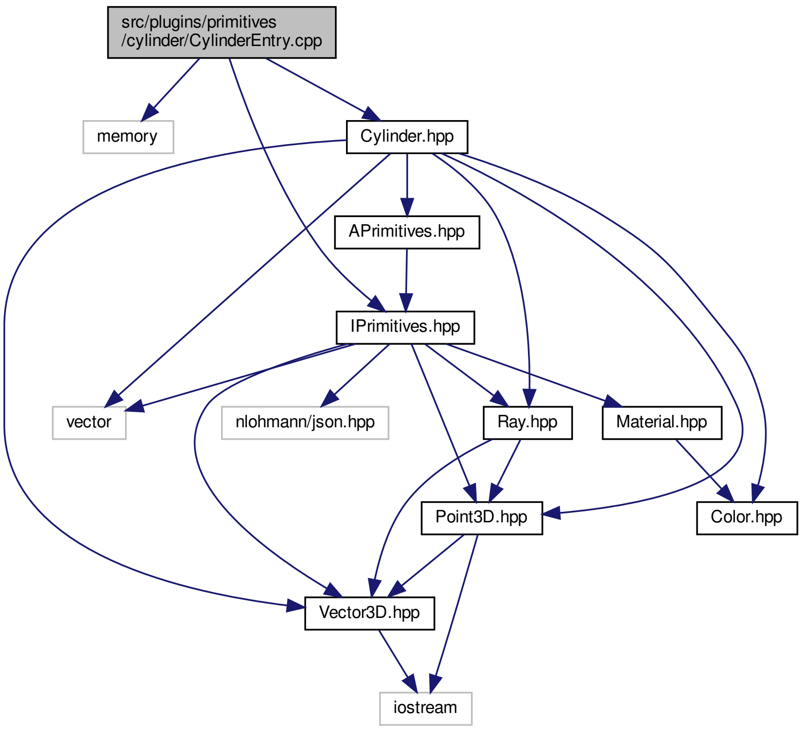
- RayTracer

  Namespace for the raytracer.

7.56 src/plugins/primitives/cylinder/CylinderEntry.cpp File Reference

```
#include <memory>
#include "IPrimitives.hpp"
#include "Cylinder.hpp"
```

Include dependency graph for CylinderEntry.cpp:



Functions

- std::unique_ptr< RayTracer::IPrimitives > entryPoint ()

7.56.1 Function Documentation

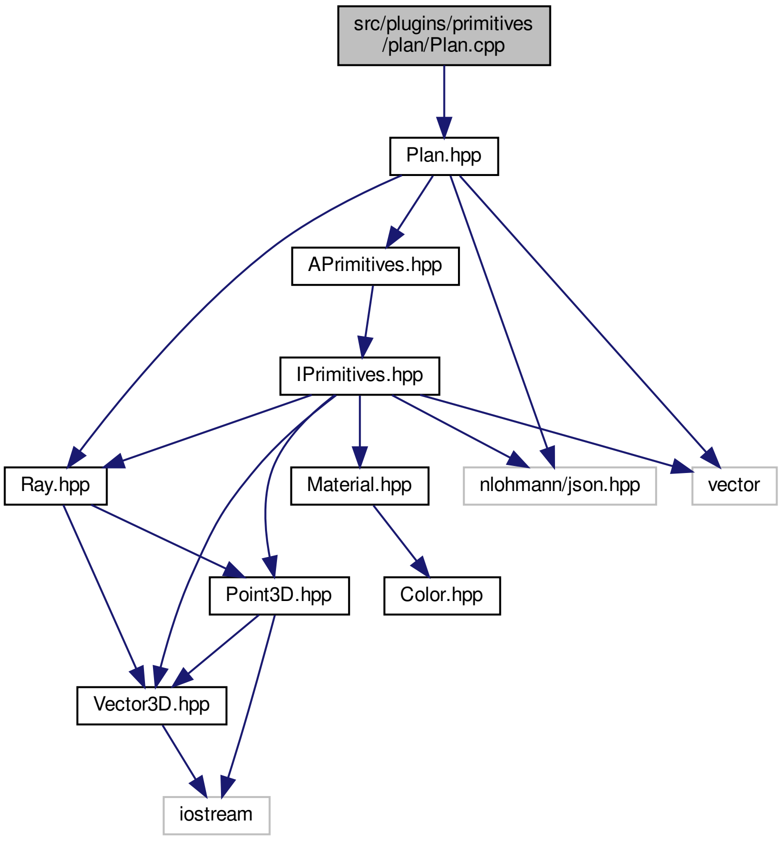
7.56.1.1 entryPoint()

```
std::unique_ptr<RayTracer::IPrimitives> entryPoint ( )
```

7.57 src/plugins/primitives/plan/Plan.cpp File Reference

```
#include "Plan.hpp"
```

Include dependency graph for Plan.cpp:



Namespaces

- RayTracer

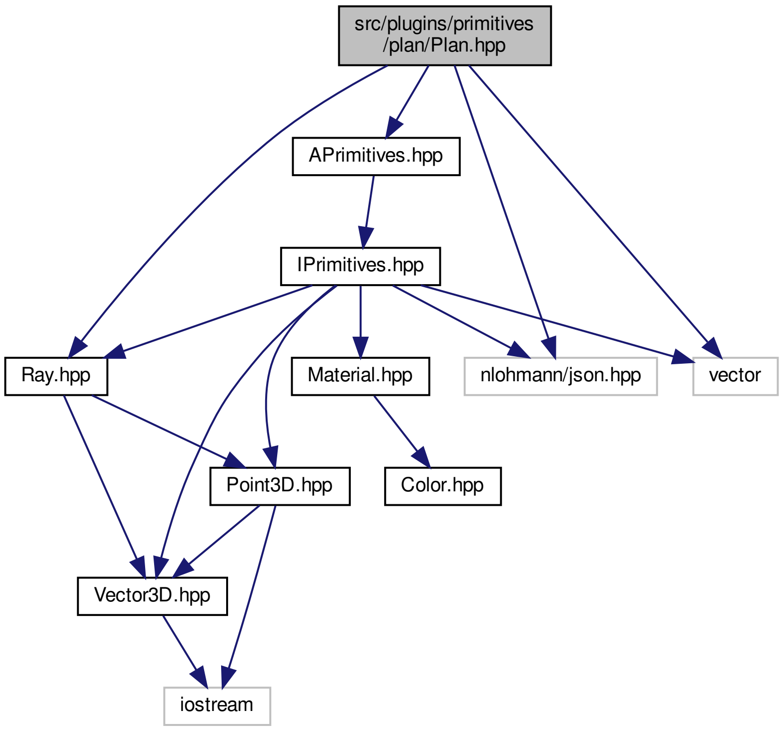
  Namespace for the raytracer.

7.58 src/plugins/primitives/plan/Plan.hpp File Reference

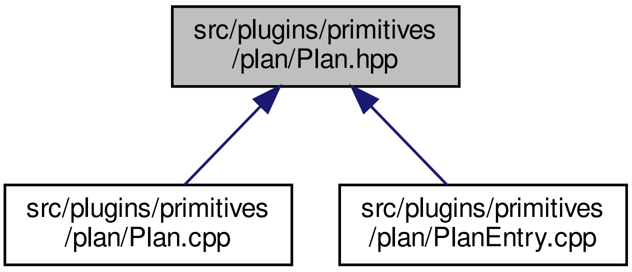
```
#include "APrimitives.hpp"
#include "Ray.hpp"
#include <nlohmann/json.hpp>
```

```
#include <vector>
```

Include dependency graph for Plan.hpp:



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



Data Structures

- class RayTracer::Plan

Namespaces

- RayTracer

  Namespace for the raytracer.

Typedefs

- using json = nlohmann::json

7.58.1 Typedef Documentation

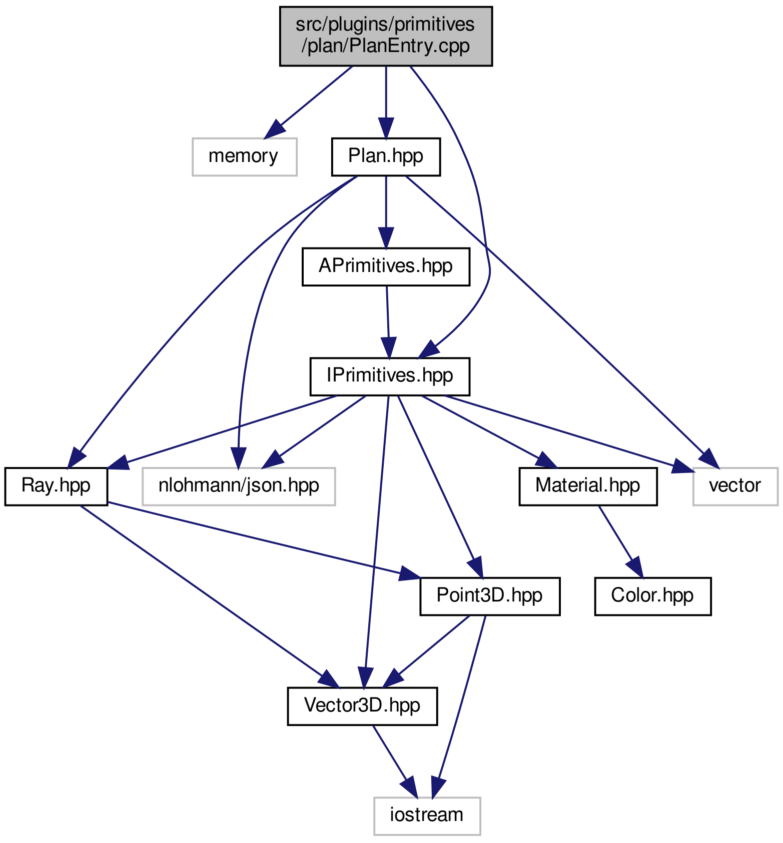
7.58.1.1 json

```
using json = nlohmann::json
```

7.59 src/plugins/primitives/plan/PlanEntry.cpp File Reference

```
#include <memory>
#include "IPrimitives.hpp"
#include "Plan.hpp"
```

Include dependency graph for PlanEntry.cpp:



Functions

- std::unique_ptr< RayTracer::IPrimitives > entryPoint ()

7.59.1 Function Documentation

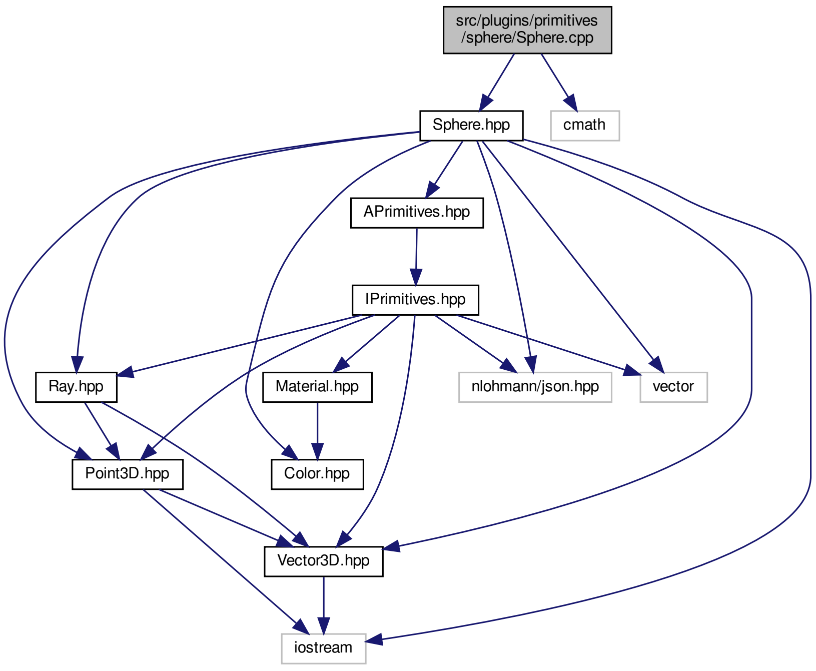
7.59.1.1 entryPoint()

```
std::unique_ptr<RayTracer::IPrimitives> entryPoint ( )
```

7.60 src/plugins/primitives/sphere/Sphere.cpp File Reference

```
#include "Sphere.hpp"
#include <cmath>
```

Include dependency graph for Sphere.cpp:



Namespaces

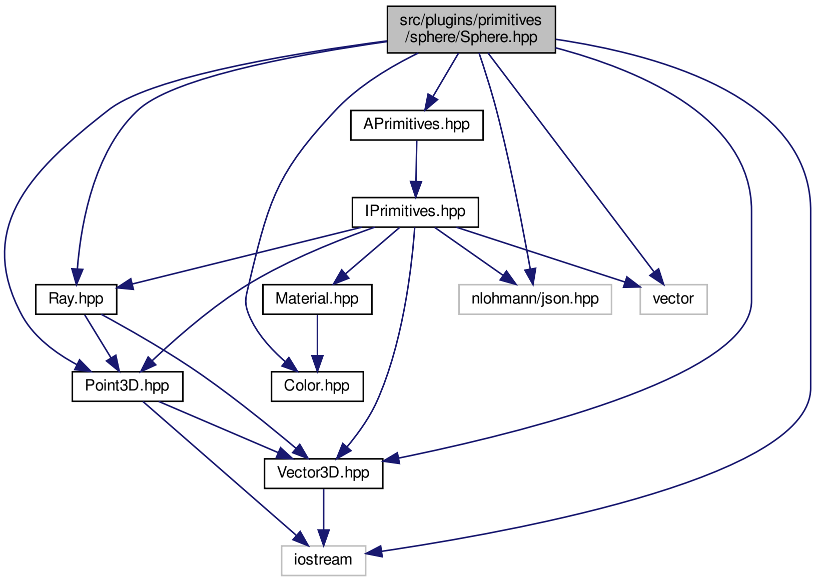
- RayTracer

  Namespace for the raytracer.

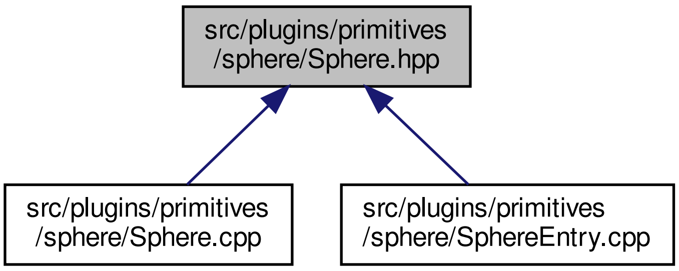
7.61 src/plugins/primitives/sphere/Sphere.hpp File Reference

```
#include "APrimitives.hpp"
#include "Color.hpp"
#include "Point3D.hpp"
#include "Ray.hpp"
#include "Vector3D.hpp"
#include <iostream>
#include <nlohmann/json.hpp>
#include <vector>
```

Include dependency graph for Sphere.hpp:



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



Data Structures

- class RayTracer::Sphere

Namespaces

- RayTracer

  Namespace for the raytracer.

Typedefs

- using json = nlohmann::json

7.61.1 Typedef Documentation

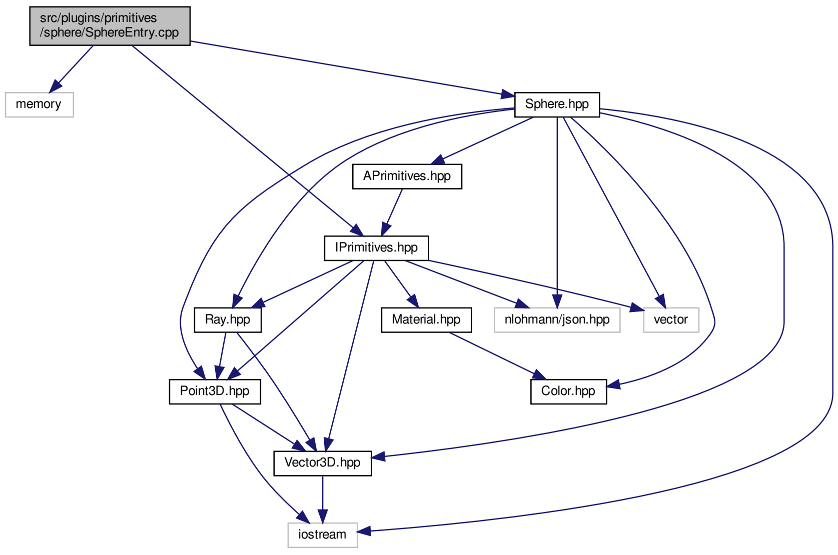
7.61.1.1 json

```
using json = nlohmann::json
```

7.62 src/plugins/primitives/sphere/SphereEntry.cpp File Reference

```
#include <memory>
#include "IPrimitives.hpp"
#include "Sphere.hpp"
```

Include dependency graph for SphereEntry.cpp:



Functions

- std::unique_ptr< RayTracer::IPrimitives > entryPoint ()

7.62.1 Function Documentation

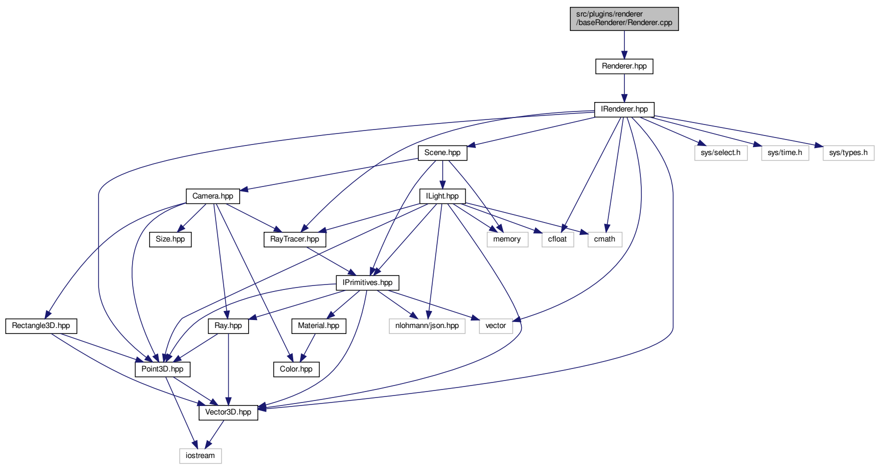
7.62.1.1 entryPoint()

```
std::unique_ptr<RayTracer::IPrimitives> entryPoint ( )
```

7.63 src/plugins/renderer/baseRenderer/Renderer.cpp File Reference

```
#include "Renderer.hpp"
```

Include dependency graph for Renderer.cpp:



Namespaces

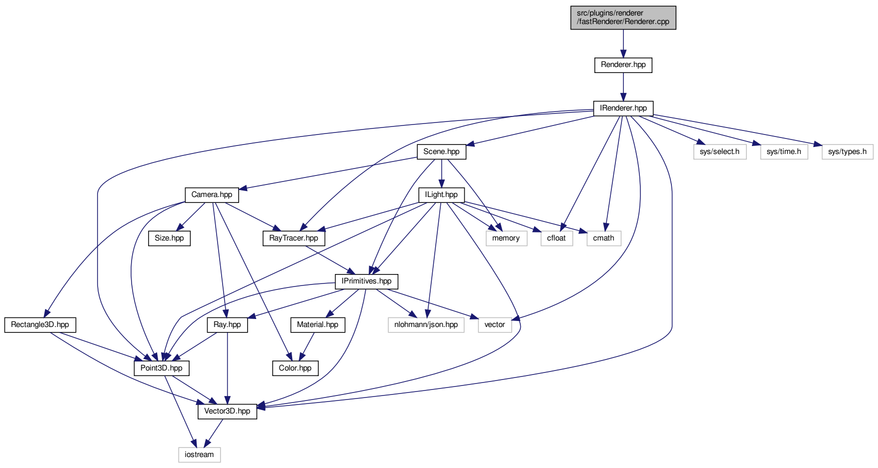
- RayTracer

  Namespace for the raytracer.

7.64 src/plugins/renderer/fastRenderer/Renderer.cpp File Reference

```
#include "Renderer.hpp"
```

Include dependency graph for Renderer.cpp:



Namespaces

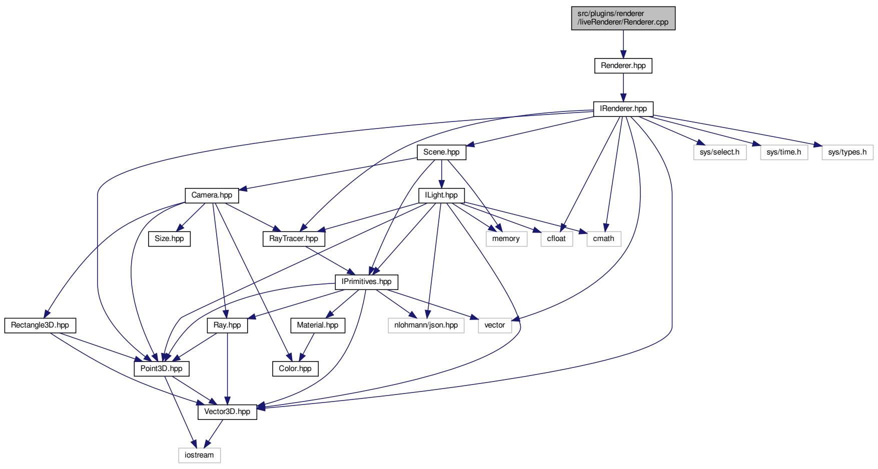
- RayTracer

  Namespace for the raytracer.

7.65 src/plugins/renderer/liveRenderer/Renderer.cpp File Reference

```
#include "Renderer.hpp"
```

Include dependency graph for Renderer.cpp:



Namespaces

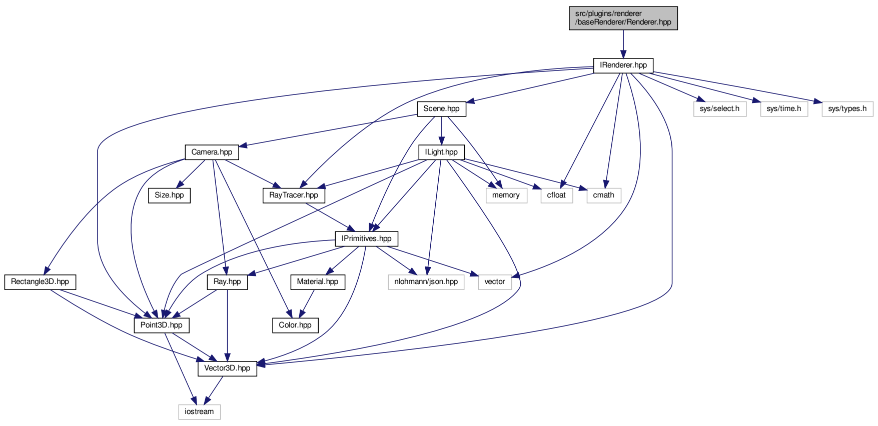
- RayTracer

  Namespace for the raytracer.

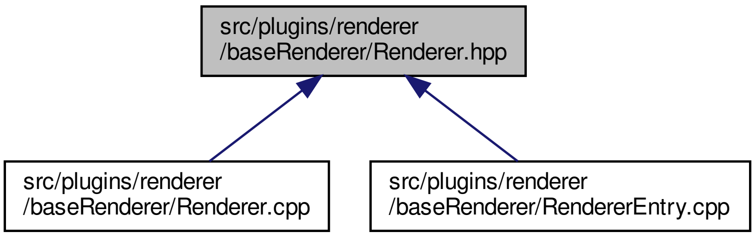
7.66 src/plugins/renderer/baseRenderer/Renderer.hpp File Reference

```
#include "IRenderer.hpp"
```

Include dependency graph for Renderer.hpp:



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


src/plugins/renderer /baseRenderer/Renderer.hpp
src/plugins/renderer /baseRenderer/Renderer.cpp
src/plugins/renderer /baseRenderer/RendererEntry.cpp

Data Structures

- class RayTracer::Renderer

Namespaces

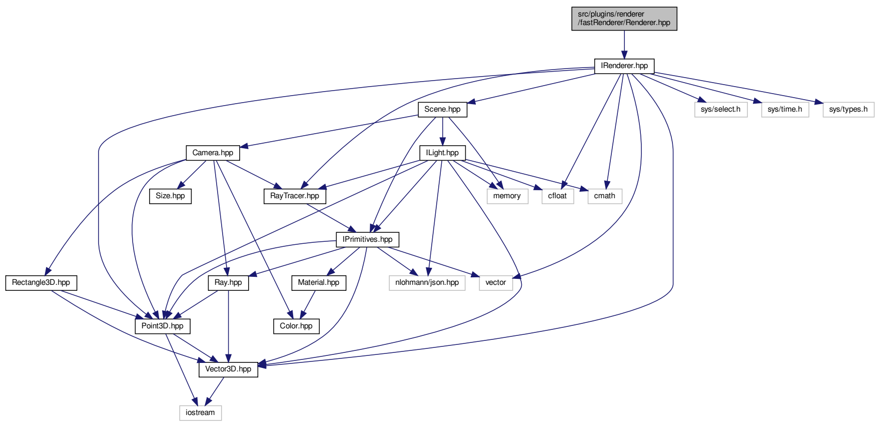
- RayTracer

  Namespace for the raytracer.

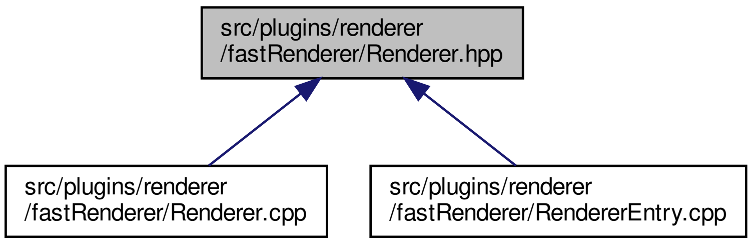
7.67 src/plugins/renderer/fastRenderer/Renderer.hpp File Reference

```
#include "IRenderer.hpp"
```

Include dependency graph for Renderer.hpp:



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


src/plugins/renderer
/fastRenderer/Renderer.hpp
src/plugins/renderer
/fastRenderer/Renderer.cpp
src/plugins/renderer
/fastRenderer/RendererEntry.cpp

Data Structures

- class RayTracer::FastRenderer

Namespaces

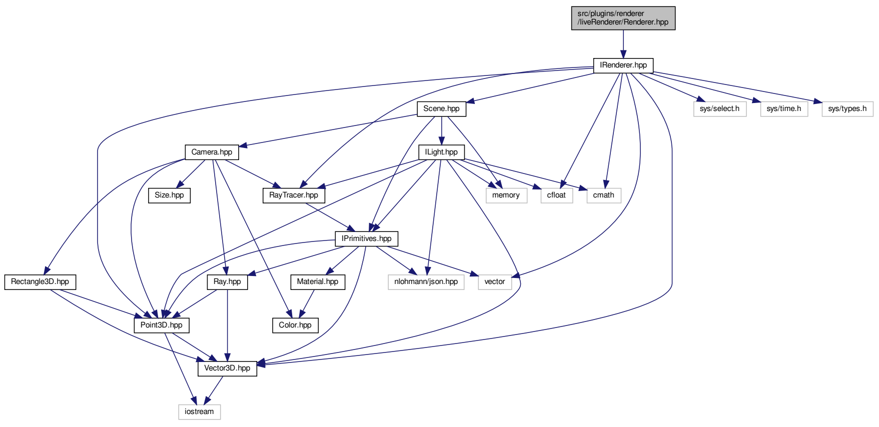
- RayTracer

    Namespace for the raytracer.

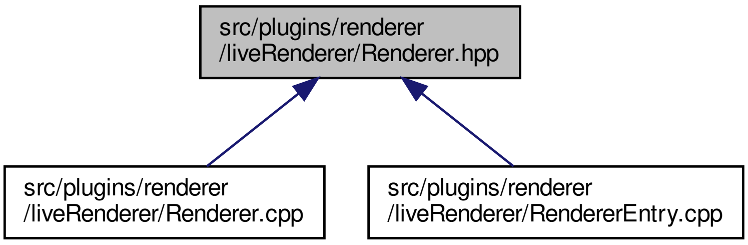
7.68 src/plugins/renderer/liveRenderer/Renderer.hpp File Reference

`#include "IRenderer.hpp"`

Include dependency graph for Renderer.hpp:



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


src/plugins/renderer
/liveRenderer/Renderer.hpp
src/plugins/renderer
/liveRenderer/Renderer.cpp
src/plugins/renderer
/liveRenderer/RendererEntry.cpp

Data Structures

- class RayTracer::LiveRenderer

Namespaces

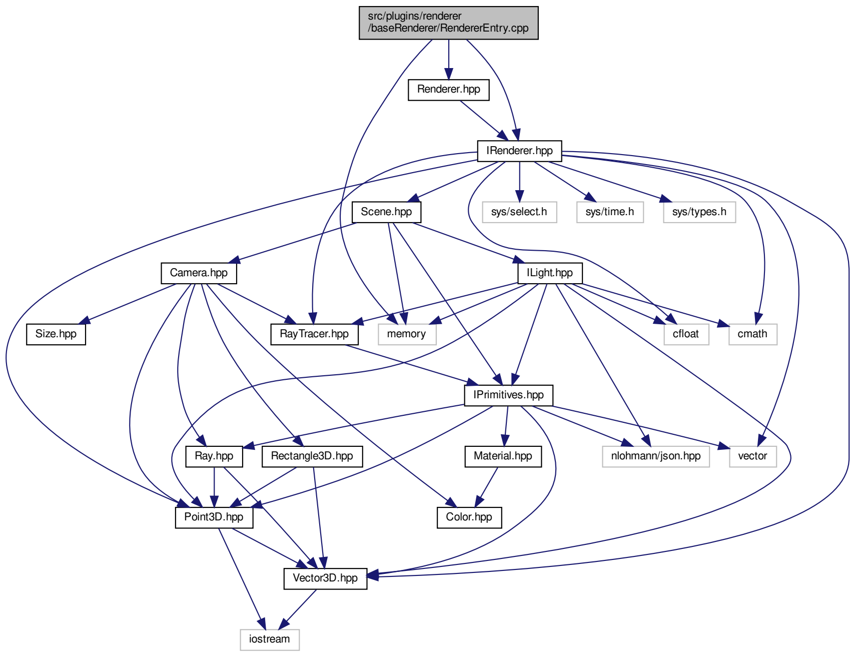
- RayTracer

  Namespace for the raytracer.

7.69 src/plugins/renderer/baseRenderer/RendererEntry.cpp File Reference

```
#include <memory>
#include "IRenderer.hpp"
#include "Renderer.hpp"
```

Include dependency graph for RendererEntry.cpp:



Functions

- std::unique_ptr< RayTracer::IRenderer > entryPoint ()

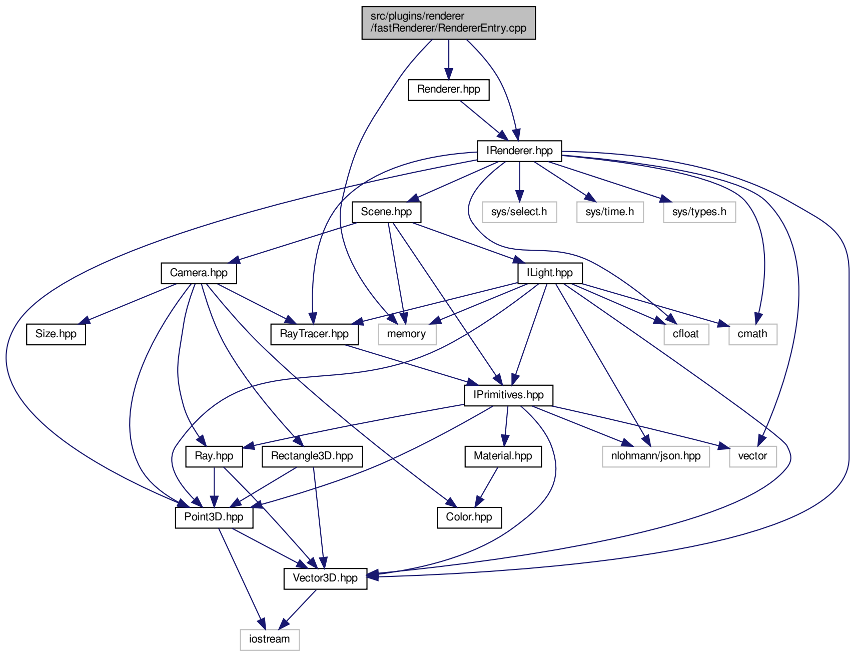
7.69.1 Function Documentation

7.69.1.1 entryPoint()

```
std::unique_ptr<RayTracer::IRenderer> entryPoint ( )
```

7.70 src/plugins/renderer/fastRenderer/RendererEntry.cpp File Reference

```
#include <memory>
#include "IRenderer.hpp"
#include "Renderer.hpp"
```
Include dependency graph for RendererEntry.cpp:



Functions

- std::unique_ptr< RayTracer::IRenderer > entryPoint ()

7.70.1 Function Documentation

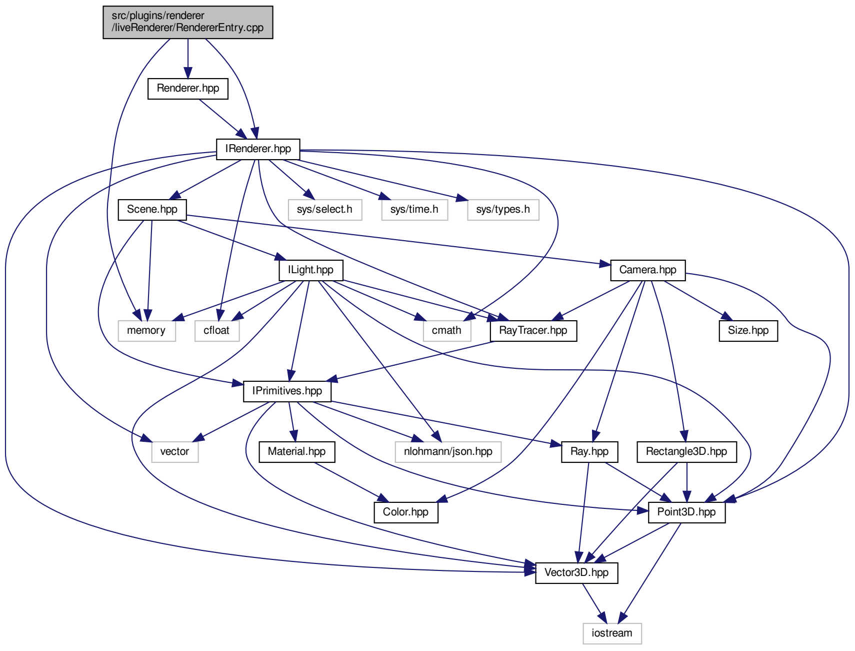
7.70.1.1 entryPoint()

```
std::unique_ptr<RayTracer::IRenderer> entryPoint ( )
```

7.71 src/plugins/renderer/liveRenderer/RendererEntry.cpp File Reference

```
#include "IRenderer.hpp"
#include "Renderer.hpp"
#include <memory>
```

Include dependency graph for RendererEntry.cpp:



Functions

- std::unique_ptr< RayTracer::IRenderer > entryPoint ()

7.71.1 Function Documentation

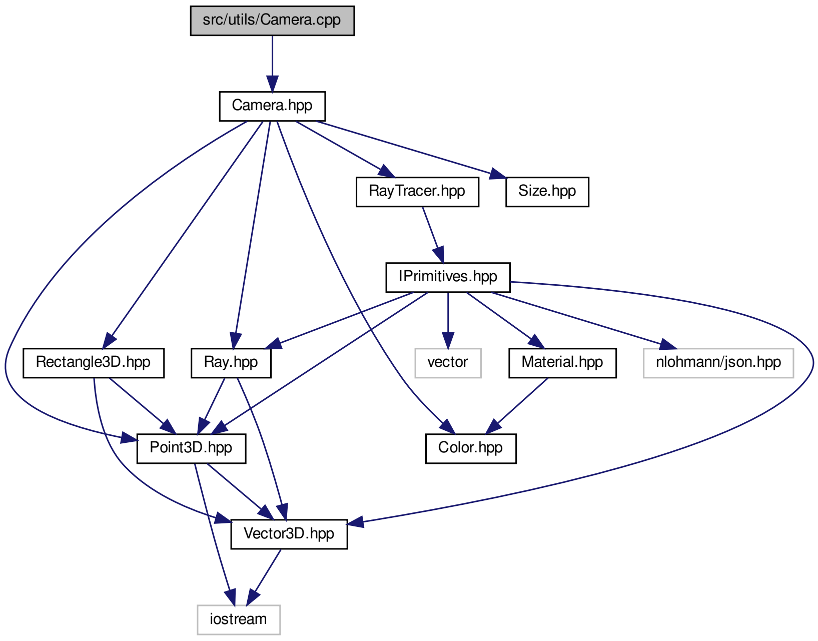
7.71.1.1 entryPoint()

```
std::unique_ptr<RayTracer::IRenderer> entryPoint ( )
```

7.72 src/utils/Camera.cpp File Reference

```
#include "Camera.hpp"
```

Include dependency graph for Camera.cpp:



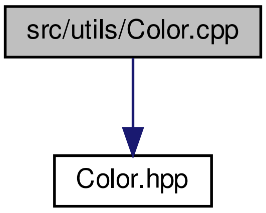
Namespaces

- RayTracer
  Namespace for the raytracer.

7.73 src/utils/Color.cpp File Reference

```
#include "Color.hpp"
```

Include dependency graph for Color.cpp:



Namespaces

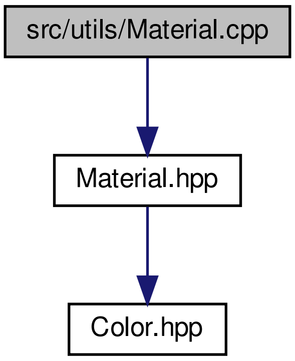
- RayTracer

  Namespace for the raytracer.

7.74 src/utils/Material.cpp File Reference

```
#include "Material.hpp"
```

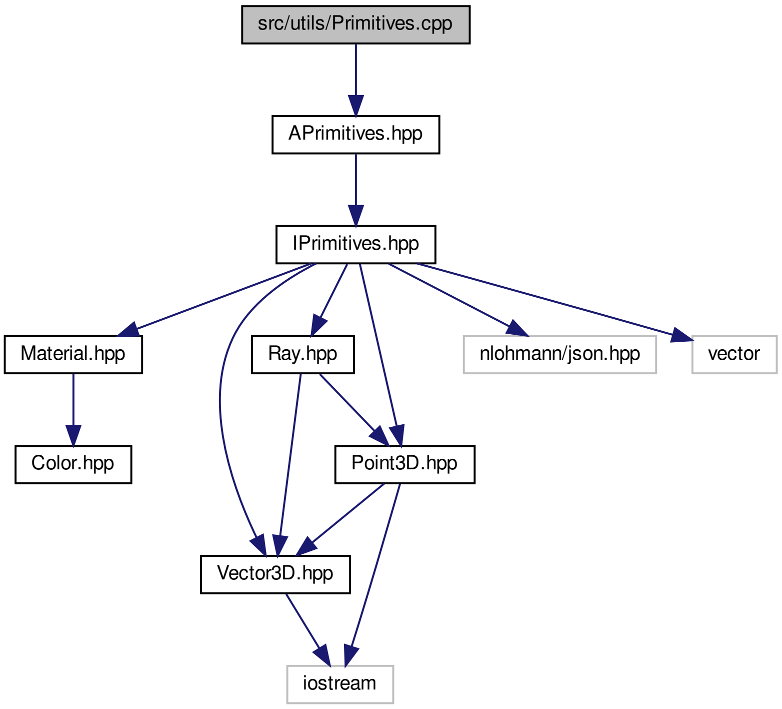
Include dependency graph for Material.cpp:



7.75 src/utils/Primitives.cpp File Reference

```
#include "APrimitives.hpp"
```

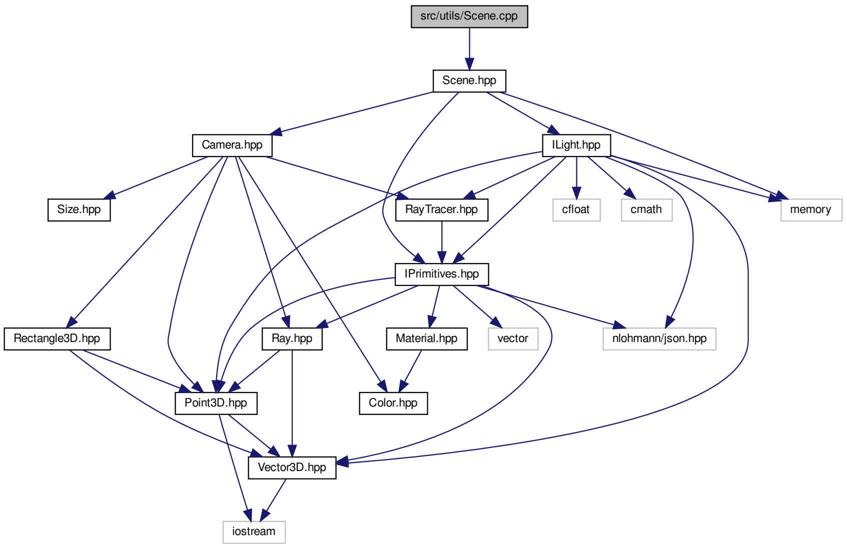
Include dependency graph for Primitives.cpp:



7.76 src/utils/Scene.cpp File Reference

```
#include "Scene.hpp"
```

Include dependency graph for Scene.cpp:



Namespaces

- RayTracer

  Namespace for the raytracer.

Index