

3dViewer

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1 Namespace Index

1.1 Namespace List

Here is a list of all documented namespaces with brief descriptions:

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|------------------------|---|
| school | 4 |
|------------------------|---|

2 Hierarchical Index

2.1 Class Hierarchy

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

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| s21::Command | 5 |
| s21::GenOrthoCommand | 10 |
| s21::GenPerspectiveCommand | 12 |
| s21::OpenFileCommand | 17 |
| s21::RotateCommand | 31 |
| s21::ScaleCommand | 33 |
| s21::TranslateCommand | 35 |
| s21::config | 6 |
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| s21::LinesStrategy | 14 |
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| s21::Strategy | 34 |

| | |
|-------------------------------------|----|
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| s21::VertexStrategy | 37 |

3 Class Index

3.1 Class List

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

| | | |
|--|--|----|
| s21::Command | | 5 |
| Base class for Command pattern | | |
| s21::config | | 6 |
| Keeps config values | | |
| s21::controller | | 7 |
| Implements the MVC pattern | | |
| s21::GenOrthoCommand | | 10 |
| Command pattern's class for creating an orthogonal projection | | |
| s21::GenPerspectiveCommand | | 12 |
| Command pattern's class for creating an perspective projection | | |
| s21::LinesStrategy | | 14 |
| Implements lines strategy rendering | | |
| s21::Model | | 15 |
| Wrapper for Command pattern | | |
| s21::Obj | | 16 |
| Result struct | | |
| s21::viewer::obj | | 16 |
| Same result class as in model | | |
| s21::OpenFileCommand | | 17 |
| Command pattern's class for open file command | | |
| s21::OpenGLWidget | | 19 |
| Base opengl implementation qt class | | |
| s21::QtShader | | 27 |
| This is a custom shader class created for the 3DViewer2.0 School21 project | | |
| s21::RotateCommand | | 31 |
| Command pattern's class for rotate command | | |
| s21::ScaleCommand | | 33 |
| Command pattern's class for scale command | | |
| s21::Strategy | | 34 |
| Implements Strategy pattern | | |
| s21::TranslateCommand | | 35 |
| Command pattern's class for translate command | | |

| | |
|--------------------------------------|----|
| s21::VertexStrategy | |
| Implements vertex strategy rendering | 37 |
| s21::viewer | |
| Base vieweer class | 38 |

4 File Index

4.1 File List

Here is a list of all documented files with brief descriptions:

| | |
|--|----|
| include/controller.h | ?? |
| include/Model.h | ?? |
| include/OpenGLWidget.h | ?? |
| include/qtshader.h | ?? |
| include/test.h | ?? |
| include/viewer.h | ?? |
| sources/ controller.cc | 43 |
| sources/main.cc | ?? |
| sources/ Model.cc | 44 |
| sources/OpenGLWidget.cc | ?? |
| sources/ qtshader.cc | 44 |
| sources/s21_matrix_oop.cc | ?? |
| sources/ viewer.cc | 45 |

5 Namespace Documentation

5.1 school Namespace Reference

5.1.1 Detailed Description

21 namespace

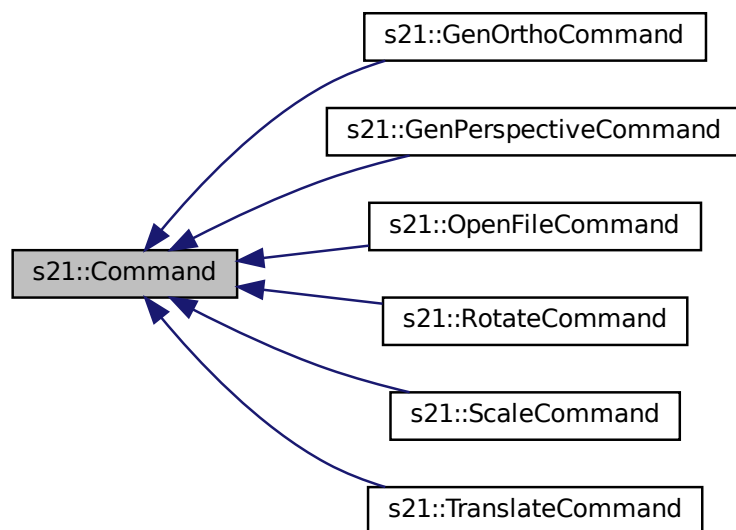
6 Class Documentation

6.1 s21::Command Struct Reference

Base class for [Command](#) pattern.

```
#include <Model.h>
```

Inheritance diagram for s21::Command:



Public Member Functions

- virtual void [execute](#) ()=0

6.1.1 Detailed Description

Base class for [Command](#) pattern.

Definition at line 29 of file `Model.h`.

6.1.2 Member Function Documentation

6.1.2.1 execute() `virtual void s21::Command::execute () [pure virtual]`

Virtual method

Implemented in [s21::GenPerspectiveCommand](#), [s21::GenOrthoCommand](#), [s21::TranslateCommand](#), [s21::ScaleCommand](#), [s21::RotateCommand](#), and [s21::OpenFileCommand](#).

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

- `include/Model.h`

6.2 s21::config Struct Reference

keeps config values

```
#include <OpenGLWidget.h>
```

Public Attributes

- `QString filename = ""`
- `QColor colors [3] = {QColor("midnightblue"), QColor("red"), QColor("yellow")}`
- `bool parallel = true`
- `bool solid = true`
- `unsigned vertices = 0`
- `unsigned vertices_size = 10`
- `unsigned edges_thickness = 5`

6.2.1 Detailed Description

keeps config values

Definition at line 24 of file `OpenGLWidget.h`.

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

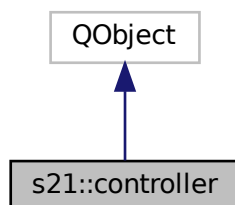
- `include/OpenGLWidget.h`

6.3 s21::controller Class Reference

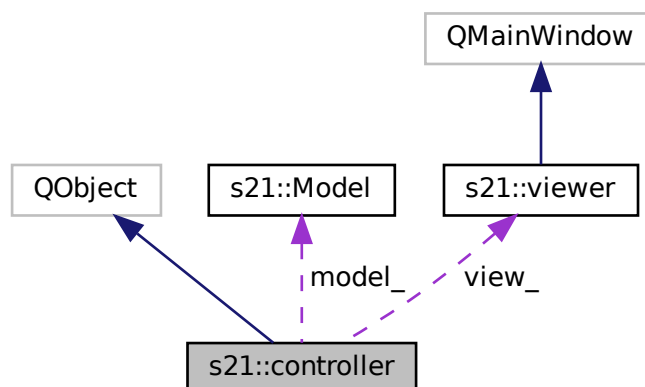
implements the MVC pattern

```
#include <controller.h>
```

Inheritance diagram for s21::controller:



Collaboration diagram for s21::controller:



Public Member Functions

- `controller` (`Model` *model, `viewer` *view, `QObject` *parent=nullptr)

Private Slots

- void `OpenFile` (const `QString` &filename) const
- void `Rotate` (float *mx, const `std::vector`< float > &vec) const
- void `Translate` (float *mx, const `std::vector`< float > &vec) const
- void `Scale` (float *, const float &) const
- void `GetOrtho` (const float &, const float &, const float &, const float &, const float &, const float &) const
- void `GetPerspective` (const float &, const float &, const float &, const float &) const

Private Attributes

- `Model * model_`
- `viewer * view_`

6.3.1 Detailed Description

implements the MVC pattern

Definition at line 26 of file controller.h.

6.3.2 Constructor & Destructor Documentation

6.3.2.1 controller() `s21::controller::controller (`
 `Model * model,`
 `viewer * view,`
 `QObject * parent = nullptr)`

Constructor. Get pointers to model and view(MVC). Connects their signals to self slots.

Parameters

| | |
|---------------|----------------------|
| <i>model</i> | - pointer to model |
| <i>view</i> | - pointer to ciew |
| <i>parent</i> | - parent fot QObject |

Definition at line 8 of file controller.cc.

6.3.3 Member Function Documentation

6.3.3.1 GetOrtho `void s21::controller::GetOrtho (`
 `const float & left,`
 `const float & right,`
 `const float & bottom,`
 `const float & top,`
 `const float & near,`
 `const float & far) const [private], [slot]`

Slot to get Ortho matrix based in provided values

Definition at line 50 of file controller.cc.

6.3.3.2 GetPerspective `void s21::controller::GetPerspective (`
`const float & fov,`
`const float & aspect,`
`const float & near,`
`const float & far) const [private], [slot]`

Slot to get Perspective matrix based in provided values

Definition at line 59 of file controller.cc.

6.3.3.3 OpenFile `void s21::controller::OpenFile (`
`const QString & filename) const [private], [slot]`

Slot for file opening

Parameters

| | |
|-----------------|----------------|
| <i>filename</i> | - file to open |
|-----------------|----------------|

Definition at line 19 of file controller.cc.

6.3.3.4 Rotate `void s21::controller::Rotate (`
`float * mx,`
`const std::vector< float > & vec) const [private], [slot]`

Slot to rotate model matrix

Parameters

| | |
|-----------|--------------------|
| <i>mx</i> | - matrix to rotate |
| - | rotation vector |

Definition at line 35 of file controller.cc.

6.3.3.5 Scale `void s21::controller::Scale (`
`float * mx,`
`const float & factor) const [private], [slot]`

Slot to scale model matrix

Parameters

| | |
|---------------|-------------------|
| <i>mx</i> | - matrix to scale |
| <i>factor</i> | - scale factor |

Definition at line 45 of file controller.cc.

6.3.3.6 Translate `void s21::controller::Translate (`
 `float * mx,`
 `const std::vector< float > & vec) const [private], [slot]`

Slot to translate model matrix

Parameters

| | |
|------------|-----------------------|
| <i>mx</i> | - matrix to translate |
| <i>vec</i> | - translation vector |

Definition at line 40 of file controller.cc.

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

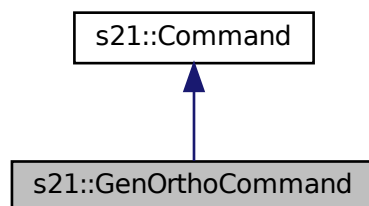
- include/controller.h
- sources/[controller.cc](#)

6.4 s21::GenOrthoCommand Class Reference

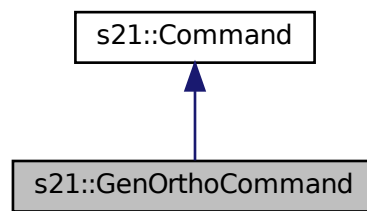
[Command](#) pattern's class for creating an orthogonal projection.

```
#include <Model.h>
```

Inheritance diagram for s21::GenOrthoCommand:



Collaboration diagram for s21::GenOrthoCommand:



Public Member Functions

- [GenOrthoCommand](#) (const float &left, const float &right, const float &bottom, const float &top, const float &near, const float &far, float *&result)

Private Member Functions

- void [execute](#) () override

Private Attributes

- float *& **result_**
- const float & **left_**
- const float & **right_**
- const float & **bottom_**
- const float & **top_**
- const float & **near_**
- const float & **far_**

6.4.1 Detailed Description

[Command](#) pattern's class for creating an orthogonal projection.

Definition at line 139 of file Model.h.

6.4.2 Constructor & Destructor Documentation

6.4.2.1 GenOrthoCommand() `s21::GenOrthoCommand::GenOrthoCommand (`
 `const float & left,`
 `const float & right,`
 `const float & bottom,`
 `const float & top,`
 `const float & near,`
 `const float & far,`
 `float *& result)`

Ctor for initializing private vars

Definition at line 146 of file Model.h.

6.4.3 Member Function Documentation

6.4.3.1 execute() `void s21::GenOrthoCommand::execute ()` `[override], [private], [virtual]`

Virtual method

Implements [s21::Command](#).

Definition at line 133 of file Model.cc.

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

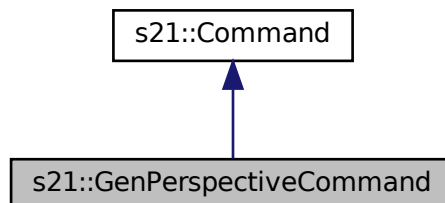
- include/Model.h
- sources/[Model.cc](#)

6.5 s21::GenPerspectiveCommand Class Reference

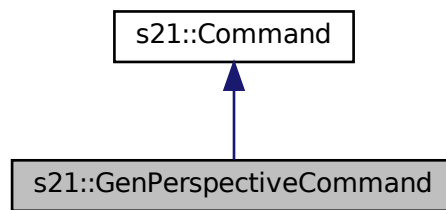
[Command](#) pattern's class for creating an perspective projection.

```
#include <Model.h>
```

Inheritance diagram for `s21::GenPerspectiveCommand`:



Collaboration diagram for s21::GenPerspectiveCommand:



Public Member Functions

- [GenPerspectiveCommand](#) (const float &fov, const float &aspect, const float &near, const float &far, float *&result)

Private Member Functions

- void [execute](#) () override

Private Attributes

- float *& **result_**
- const float & **fov_**
- const float & **aspect_**
- const float & **near_**
- const float & **far_**

6.5.1 Detailed Description

[Command](#) pattern's class for creating an perspective projection.

Definition at line 166 of file Model.h.

6.5.2 Constructor & Destructor Documentation

6.5.2.1 GenPerspectiveCommand() `s21::GenPerspectiveCommand::GenPerspectiveCommand (const float & fov, const float & aspect, const float & near, const float & far, float *& result)`

Ctor for initializing private vars

Definition at line 173 of file Model.h.

6.5.3 Member Function Documentation

6.5.3.1 `execute()` `void s21::GenPerspectiveCommand::execute () [override], [private], [virtual]`

Virtual method

Implements [s21::Command](#).

Definition at line 148 of file `Model.cc`.

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

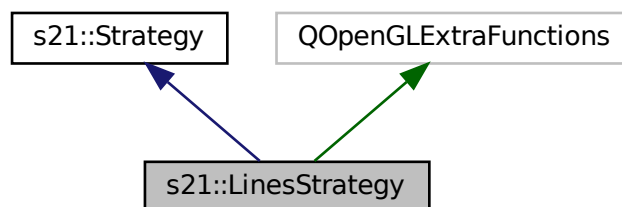
- `include/Model.h`
- `sources/Model.cc`

6.6 `s21::LinesStrategy` Class Reference

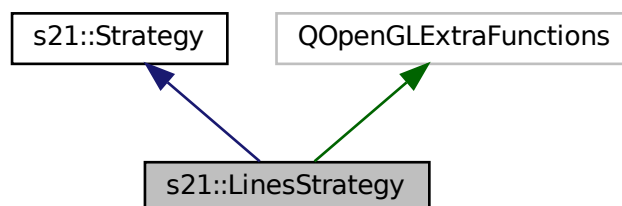
Implements lines strategy rendering.

```
#include <OpenGLWidget.h>
```

Inheritance diagram for `s21::LinesStrategy`:



Collaboration diagram for `s21::LinesStrategy`:



Public Member Functions

- void **Render** ([QtShader](#) shader, const S21Matrix &mvp, const [config](#) &conf, const int &size) override

6.6.1 Detailed Description

Implements lines strategy rendering.

Definition at line 60 of file OpenGLWidget.h.

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

- include/OpenGLWidget.h
- sources/OpenGLWidget.cc

6.7 s21::Model Class Reference

Wrapper for [Command](#) pattern.

```
#include <Model.h>
```

Static Public Member Functions

- static void [ExecuteCommand](#) ([Command](#) *command)

6.7.1 Detailed Description

Wrapper for [Command](#) pattern.

Definition at line 186 of file Model.h.

6.7.2 Member Function Documentation

6.7.2.1 [ExecuteCommand\(\)](#)

```
void s21::Model::ExecuteCommand (
    Command * command ) [static]
```

Execution method

Parameters

| | |
|----------------|----------------------|
| <i>command</i> | - command to execute |
|----------------|----------------------|

Definition at line 144 of file Model.cc.

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

- include/Model.h
- sources/[Model.cc](#)

6.8 s21::Obj Struct Reference

result struct

```
#include <Model.h>
```

Public Attributes

- vertex * **vertexes** = nullptr
- facet * **facetes** = nullptr
- float **min** = std::nanf("NAN")
- float **max** = std::nanf("NAN")

6.8.1 Detailed Description

result struct

Definition at line 42 of file Model.h.

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

- include/Model.h

6.9 s21::viewer::obj Struct Reference

Same result class as in model.

```
#include <viewer.h>
```

Public Attributes

- std::vector< float > * **vertexes** = nullptr
- std::vector< unsigned > * **facetes** = nullptr
- float **min** = std::nanf("NAN")
- float **max** = std::nanf("NAN")

6.9.1 Detailed Description

Same result class as in model.

Definition at line 38 of file viewer.h.

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

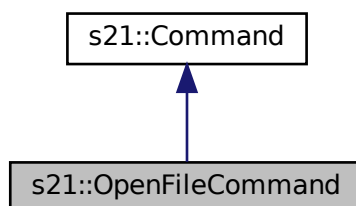
- include/viewer.h

6.10 s21::OpenFileCommand Class Reference

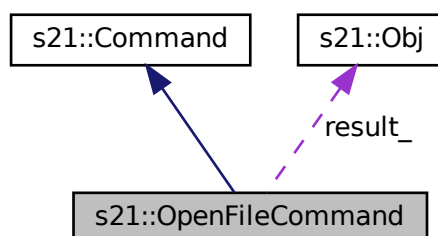
[Command](#) pattern's class for open file command.

```
#include <Model.h>
```

Inheritance diagram for s21::OpenFileCommand:



Collaboration diagram for s21::OpenFileCommand:



Public Member Functions

- [OpenFileCommand](#) (std::string filename, [Obj](#) &result)
- void [execute](#) () override

Private Member Functions

- void **Open** ()
- void **ReadObj** ()
- float & **FindMaxMin** (float &num) &noexcept
- unsigned int **CorrectIndex** (const int &num) const noexcept

Private Attributes

- `std::string filename_`
- `Obj & result_`
- `std::ifstream in_file_`

6.10.1 Detailed Description

[Command](#) pattern's class for open file command.

Definition at line 53 of file `Model.h`.

6.10.2 Constructor & Destructor Documentation

6.10.2.1 OpenFileCommand() `s21::OpenFileCommand::OpenFileCommand (`
 `std::string filename,`
 `Obj & result)`

Ctor for initializing private vars

Definition at line 58 of file `Model.h`.

6.10.3 Member Function Documentation

6.10.3.1 execute() `void s21::OpenFileCommand::execute () [override], [virtual]`

Virtual method

Implements [s21::Command](#).

Definition at line 86 of file `Model.cc`.

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

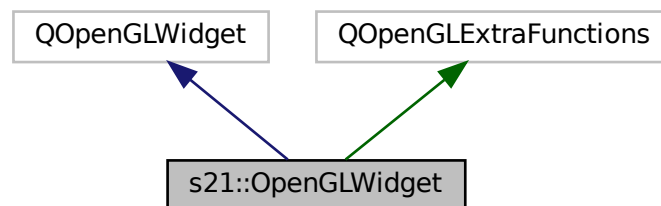
- `include/Model.h`
- `sources/Model.cc`

6.11 s21::OpenGLWidget Class Reference

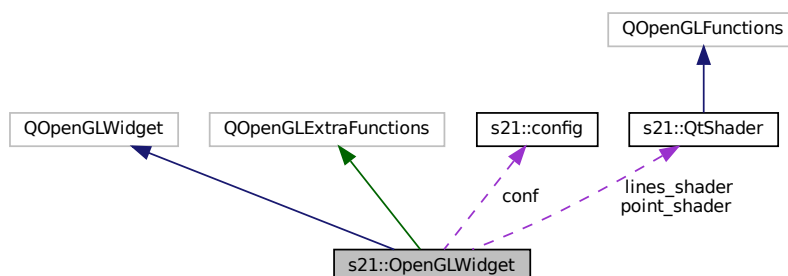
Base opengl implementation qt class.

```
#include <OpenGLWidget.h>
```

Inheritance diagram for s21::OpenGLWidget:



Collaboration diagram for s21::OpenGLWidget:



Public Types

- using **vertex** = std::vector< float >
- using **facet** = std::vector< unsigned >

Signals

- void [OpenFileSignal](#) (const QString &filename)
- void [RotateMatrix](#) (float *, const std::vector< float > &)
- void [TranslateMatrix](#) (float *, const std::vector< float > &)
- void [ScaleMatrix](#) (float *, const float &)
- void [GetOrthoMatrix](#) (const float &, const float &, const float &, const float &, const float &, const float &)
- void [GetPerspectiveMatrix](#) (const float &, const float &, const float &, const float &)

Public Member Functions

- [OpenGLWidget](#) (QWidget *parent=nullptr)
- [~OpenGLWidget](#) () override
- void [initializeGL](#) () override
- void [resizeGL](#) (int w, int h) override
- void [paintGL](#) () override
- void [SetObj](#) (const vertex *vx, const facet *ft, const float &min, const float &max)
- void [ScaleObject](#) (const float &factor)
- void [TranslateObject](#) (const std::vector< float > &vec)
- void [RotateObject](#) (const std::vector< float > &vec)
- void [SetResultMatrix](#) (float *result)

Public Attributes

- [s21::config](#) conf

Private Member Functions

- void [SetBuffers](#) ()
- void [FreeBuffers](#) ()
- void [mousePressEvent](#) (QMouseEvent *mo) override
- void [mouseMoveEvent](#) (QMouseEvent *mo) override
- void [CreateBuffers](#) ()
- void [wheelEvent](#) (QWheelEvent *event) override
- void [SetPerspectiveMatrix](#) ()
- void [SetStrategy](#) (std::unique_ptr< [s21::Strategy](#) > &&strategy)

Private Attributes

- const s21::S21Matrix **view_**
- const vertex * **vertexes** = nullptr
- const facet * **facetes** = nullptr
- s21::S21Matrix **projection_**
- s21::S21Matrix **mvp_**
- s21::S21Matrix **identity_** = s21::S21Matrix::CreateIdentity(4)
- s21::S21Matrix * **needed_matrix_** = nullptr
- GLuint **VAO** = 0
- GLuint **VBO** = 0
- GLuint **IBO** = 0
- [s21::QtShader](#) **lines_shader**
- [s21::QtShader](#) **point_shader**
- QPoint **mPos**
- std::unique_ptr< [s21::Strategy](#) > **current_render_strategy_**

6.11.1 Detailed Description

Base opengl implementation qt class.

Definition at line 70 of file OpenGLWidget.h.

6.11.2 Constructor & Destructor Documentation

6.11.2.1 OpenGLWidget() `s21::OpenGLWidget::OpenGLWidget (QWidget * parent = nullptr) [explicit]`

opengl class ctor

Parameters

| | |
|---------------|----------------|
| <i>parent</i> | QWidget parent |
|---------------|----------------|

Definition at line 9 of file OpenGLWidget.cc.

6.11.2.2 ~OpenGLWidget() `s21::OpenGLWidget::~~OpenGLWidget () [override]`

Corresponding dtor

Definition at line 11 of file OpenGLWidget.cc.

6.11.3 Member Function Documentation**6.11.3.1 CreateBuffers()** `void s21::OpenGLWidget::CreateBuffers () [private]`

Creates opengl buffers

Definition at line 134 of file OpenGLWidget.cc.

6.11.3.2 FreeBuffers() `void s21::OpenGLWidget::FreeBuffers () [private]`

Frees private vars

Definition at line 88 of file OpenGLWidget.cc.

6.11.3.3 GetOrthoMatrix `void s21::OpenGLWidget::GetOrthoMatrix (`
 `const float & ,`
 `const float & ,`
 `const float & ,`
 `const float & ,`
 `const float & ,`
 `const float &) [signal]`

Signal to get Ortho matrix based in provided values

6.11.3.4 GetPerspectiveMatrix `void s21::OpenGLWidget::GetPerspectiveMatrix (`
 `const float & ,`
 `const float & ,`
 `const float & ,`
 `const float &) [signal]`

Signal to get Perspective matrix based in provided values

6.11.3.5 initializeGL() void s21::OpenGLWidget::initializeGL () [override]

default qt opengl initialize func

Definition at line 19 of file OpenGLWidget.cc.

6.11.3.6 mouseMoveEvent() void s21::OpenGLWidget::mouseMoveEvent (
QMouseEvent * *mo*) [override], [private]

Method to rotate and move object with mouse

Parameters

| | |
|-----------|--|
| <i>mo</i> | |
|-----------|--|

Definition at line 95 of file OpenGLWidget.cc.

6.11.3.7 OpenFileSignal void s21::OpenGLWidget::OpenFileSignal (
const QString & *filename*) [signal]

Signal to open the file

Parameters

| | |
|-----------------|--------|
| <i>filename</i> | - file |
|-----------------|--------|

6.11.3.8 paintGL() void s21::OpenGLWidget::paintGL () [override]

default qt opengl paint func

Definition at line 44 of file OpenGLWidget.cc.

6.11.3.9 resizeGL() void s21::OpenGLWidget::resizeGL (
int *w*,
int *h*) [override]

default qt opengl resize func

Definition at line 42 of file OpenGLWidget.cc.

6.11.3.10 RotateMatrix void s21::OpenGLWidget::RotateMatrix (
float * ,
const std::vector< float > &) [signal]

Signal to rotate model matrix

Parameters

| | |
|-----------|--------------------|
| <i>mx</i> | - matrix to rotate |
| - | rotation vector |

6.11.3.11 RotateObject() `void s2l::OpenGLWidget::RotateObject (`
`const std::vector< float > & vec)`

Public method for scale. Needed to cal from ui.

Parameters

| | |
|------------|--|
| <i>vec</i> | |
|------------|--|

Definition at line 130 of file OpenGLWidget.cc.

6.11.3.12 ScaleMatrix `void s2l::OpenGLWidget::ScaleMatrix (`
`float * ,`
`const float &) [signal]`

Signal to scale model matrix

Parameters

| | |
|---------------|-------------------|
| <i>mx</i> | - matrix to scale |
| <i>factor</i> | - scale factor |

6.11.3.13 ScaleObject() `void s2l::OpenGLWidget::ScaleObject (`
`const float & factor)`

Public method for rotation. Needed to cal from ui.

Parameters

| | |
|---------------|--|
| <i>factor</i> | |
|---------------|--|

Definition at line 122 of file OpenGLWidget.cc.

6.11.3.14 SetBuffers() `void s2l::OpenGLWidget::SetBuffers () [private]`

Setting Opengl buffers

Definition at line 32 of file OpenGLWidget.cc.

6.11.3.15 SetObj() `void s21::OpenGLWidget::SetObj (`
`const vertex * vx,`
`const facet * ft,`
`const float & min,`
`const float & max)`

Method sets class private vars with input data from newly opened file

Parameters

| | |
|------------|----------------------------|
| <i>vx</i> | - pointer to vertex vector |
| <i>ft</i> | - pointer to facets vector |
| <i>min</i> | - min vertex value |
| <i>max</i> | - max vertex value |

Definition at line 75 of file OpenGLWidget.cc.

6.11.3.16 SetPerspectiveMatrix() `void s21::OpenGLWidget::SetPerspectiveMatrix () [private]`

Choosing and setting perspective matrix

Definition at line 65 of file OpenGLWidget.cc.

6.11.3.17 SetResultMatrix() `void s21::OpenGLWidget::SetResultMatrix (`
`float * result)`

Public method called from viewer to set result matrix provided by controller

Parameters

| | |
|---------------|--|
| <i>factor</i> | |
|---------------|--|

Definition at line 145 of file OpenGLWidget.cc.

6.11.3.18 SetStrategy() `void s21::OpenGLWidget::SetStrategy (`
`std::unique_ptr< s21::Strategy > && strategy) [private]`

Sets strategy fro [Strategy](#) pattern

Parameters

| | |
|-----------------|--|
| <i>strategy</i> | |
|-----------------|--|

Definition at line 221 of file OpenGLWidget.h.

6.11.3.19 TranslateMatrix `void s21::OpenGLWidget::TranslateMatrix (`
 `float * ,`
 `const std::vector< float > &) [signal]`

Signal to translate model matrix

Parameters

| | |
|------------|-----------------------|
| <i>mx</i> | - matrix to translate |
| <i>vec</i> | - translation vector |

6.11.3.20 TranslateObject() `void s21::OpenGLWidget::TranslateObject (`
 `const std::vector< float > & vec)`

Public method for translation. Needed to cal from ui.

Parameters

| | |
|------------|--|
| <i>vec</i> | |
|------------|--|

Definition at line 126 of file OpenGLWidget.cc.

6.11.3.21 wheelEvent() `void s21::OpenGLWidget::wheelEvent (`
 `QWheelEvent * event) [override], [private]`

Method to rotate and scale object with mouse

Parameters

| | |
|-----------|--|
| <i>mo</i> | |
|-----------|--|

Definition at line 111 of file OpenGLWidget.cc.

6.11.4 Member Data Documentation

6.11.4.1 view_ const s21::S21Matrix s21::OpenGLWidget::view_ [private]

Initial value:

```
= {  
    4, 4, {1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, -1.0f, 1}}
```

Definition at line 226 of file OpenGLWidget.h.

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

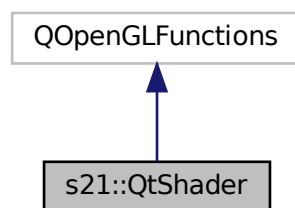
- include/OpenGLWidget.h
- sources/OpenGLWidget.cc

6.12 s21::QtShader Class Reference

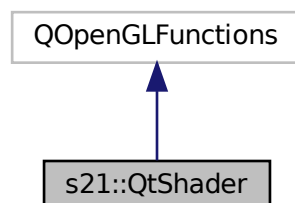
This is a custom shader class created for the 3DViewer2.0 School21 project.

```
#include <qtshader.h>
```

Inheritance diagram for s21::QtShader:



Collaboration diagram for s21::QtShader:



Public Member Functions

- void [InitShader](#) (const std::string &vshader_filepath, const std::string &fshader_filepath)
This function initializes shader by compiling shader program with given sources files.
- void [SetUniVariable](#) (const char *name, const float *value)
This function setups a uniform variable inside the shader.
- void [SetUniVec4Fl](#) (const char *name, const std::vector< float > &vec)
This function setups a uniform vec4 variable inside the shader.
- unsigned int [GetShaderId](#) ()
This function returns shader program id.
- void [DeleteShader](#) ()
This function deletes shader program.
- void [Use](#) ()
This function invokes glUseProgram to render the scene with this shader.
- void [SetUniVariable](#) (const char *name, const float &value)
This is an overloaded function, which setups a uniform mat4 variable inside the shader.
- void [SetUniVariable](#) (const char *name, const int &value)
This function setups a uniform int variable inside the shader.

Private Member Functions

- unsigned int [CompileShader](#) (const std::string &shader_source, unsigned int shader_type)
This private function setups shader compilation process.
- std::string [GetShader](#) (const std::string &filepath)
This function loads shader source code from the file.

Private Attributes

- unsigned int [id_](#)

6.12.1 Detailed Description

This is a custom shader class created for the 3DViewer2.0 School21 project.

Definition at line 22 of file qtshader.h.

6.12.2 Member Function Documentation

6.12.2.1 CompileShader() unsigned int s21::QtShader::CompileShader (
const std::string & *shader_source*,
unsigned int *shader_type*) [private]

This private function setups shader compilation process.

Parameters

| | |
|----------------------|--------------------|
| <i>shader_source</i> | - as it is. |
| <i>shader_type</i> | - vertex/fragment. |

Definition at line 45 of file qtshader.cc.

6.12.2.2 GetShader() `std::string s21::QtShader::GetShader (const std::string & filepath) [private]`

This function loads shader source code from the file.

using filestream.

Definition at line 61 of file qtshader.cc.

6.12.2.3 InitShader() `void s21::QtShader::InitShader (const std::string & vshader_filepath, const std::string & fshader_filepath)`

This function initializes shader by compiling shader program with given sources files.

Parameters

| | |
|-------------------------|-------------------------------------|
| <i>vshader_filepath</i> | - filepath for the vertex shader. |
| <i>fshader_filepath</i> | - filepath for the fragment shader. |

Definition at line 5 of file qtshader.cc.

6.12.2.4 SetUniVariable() [1/2] `void s21::QtShader::SetUniVariable (const char * name, const float & value)`

This is an overloaded function, which setups a uniform mat4 variable inside the shader.

mat4 is a GLSL dapa type of 4x4 matrix.

Parameters

| | |
|--------------|---------------------------------|
| <i>name</i> | - variable name. |
| <i>value</i> | - pointer to the first element. |

Definition at line 40 of file qtshader.cc.

6.12.2.5 SetUniVariable() [2/2] `void s2l::QtShader::SetUniVariable (`
 `const char * name,`
 `const float * value)`

This function setups a uniform variable inside the shader.

Parameters

| | |
|--------------|------------------|
| <i>name</i> | - variable name. |
| <i>value</i> | - its' value. |

Definition at line 35 of file qtshader.cc.

6.12.2.6 SetUniVariableI() `void s2l::QtShader::SetUniVariableI (`
 `const char * name,`
 `const int & value)`

This function setups a uniform int variable inside the shader.

Parameters

| | |
|--------------|------------------|
| <i>name</i> | - variable name. |
| <i>value</i> | - its' value. |

Definition at line 74 of file qtshader.cc.

6.12.2.7 SetUniVec4Fl() `void s2l::QtShader::SetUniVec4Fl (`
 `const char * name,`
 `const std::vector< float > & vec)`

This function setups a uniform vec4 variable inside the shader.

vec4 is a GLSL dapa type of 4 coordinates.

Parameters

| | |
|-------------|------------------|
| <i>name</i> | - variable name. |
| <i>vec</i> | - its' data. |

Definition at line 70 of file qtshader.cc.

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

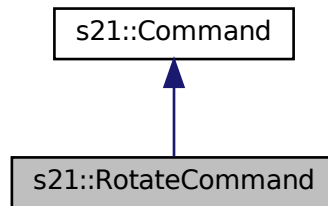
- include/qtshader.h
- sources/[qtshader.cc](#)

6.13 s21::RotateCommand Class Reference

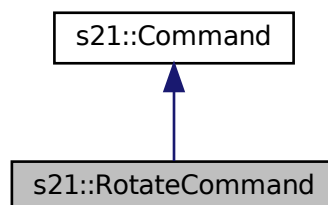
[Command](#) pattern's class for rotate command.

```
#include <Model.h>
```

Inheritance diagram for s21::RotateCommand:



Collaboration diagram for s21::RotateCommand:



Public Member Functions

- [RotateCommand](#) (float *matrix, const std::vector< float > &vec)

Private Member Functions

- void [execute](#) () override

Private Attributes

- float * **matrix_**
- const std::vector< float > **angle_**

6.13.1 Detailed Description

[Command](#) pattern's class for rotate command.

Definition at line 82 of file Model.h.

6.13.2 Constructor & Destructor Documentation

6.13.2.1 RotateCommand() `s21::RotateCommand::RotateCommand (`
 `float * matrix,`
 `const std::vector< float > & vec)`

Ctor for initializing private vars

Definition at line 89 of file Model.h.

6.13.3 Member Function Documentation

6.13.3.1 execute() `void s21::RotateCommand::execute ()` `[override], [private], [virtual]`

Virtual method

Implements [s21::Command](#).

Definition at line 92 of file Model.cc.

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

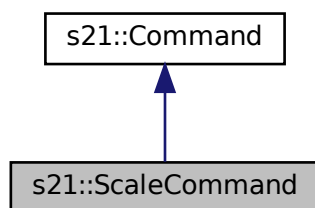
- include/Model.h
- sources/[Model.cc](#)

6.14 s21::ScaleCommand Class Reference

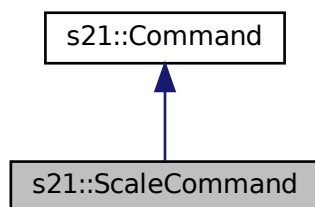
[Command](#) pattern's class for scale command.

```
#include <Model.h>
```

Inheritance diagram for s21::ScaleCommand:



Collaboration diagram for s21::ScaleCommand:



Public Member Functions

- [ScaleCommand](#) (float *matrix, const float &factor)

Private Member Functions

- void [execute](#) () override

Private Attributes

- float * **matrix_**
- const float **factor_**

6.14.1 Detailed Description

[Command](#) pattern's class for scale command.

Definition at line 101 of file Model.h.

6.14.2 Constructor & Destructor Documentation

6.14.2.1 ScaleCommand() `s21::ScaleCommand::ScaleCommand (`
 `float * matrix,`
 `const float & factor)`

Ctor for initializing private vars

Definition at line 108 of file Model.h.

6.14.3 Member Function Documentation

6.14.3.1 execute() `void s21::ScaleCommand::execute ()` `[override], [private], [virtual]`

Virtual method

Implements [s21::Command](#).

Definition at line 113 of file Model.cc.

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

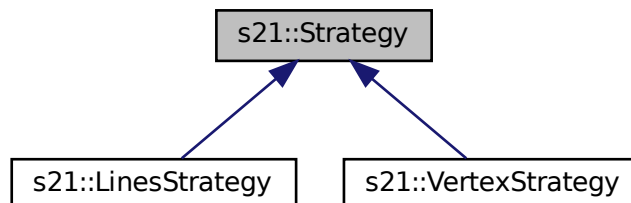
- include/Model.h
- sources/[Model.cc](#)

6.15 s21::Strategy Class Reference

implements [Strategy](#) pattern

```
#include <OpenGLWidget.h>
```

Inheritance diagram for s21::Strategy:



Public Member Functions

- virtual void **Render** ([QtShader](#) shader, const S21Matrix &mvp, const [config](#) &conf, const int &size)=0

6.15.1 Detailed Description

implements [Strategy](#) pattern

Definition at line 38 of file OpenGLWidget.h.

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

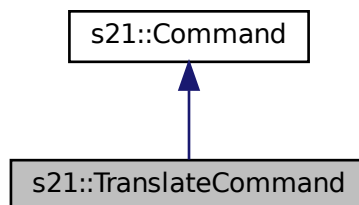
- include/OpenGLWidget.h

6.16 s21::TranslateCommand Class Reference

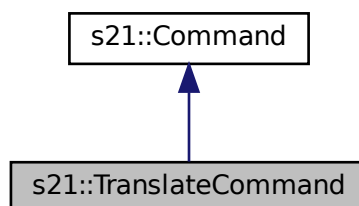
[Command](#) pattern's class for translate command.

```
#include <Model.h>
```

Inheritance diagram for s21::TranslateCommand:



Collaboration diagram for s21::TranslateCommand:



Public Member Functions

- [TranslateCommand](#) (float *matrix, const std::vector< float > &vec)

Private Member Functions

- void [execute](#) () override

Private Attributes

- float * **matrix_**
- const std::vector< float > **vec_**

6.16.1 Detailed Description

[Command](#) pattern's class for translate command.

Definition at line 120 of file Model.h.

6.16.2 Constructor & Destructor Documentation

6.16.2.1 TranslateCommand() `s21::TranslateCommand::TranslateCommand (float * matrix, const std::vector< float > & vec)`

Ctor for initializing private vars

Definition at line 127 of file Model.h.

6.16.3 Member Function Documentation

6.16.3.1 execute() `void s21::TranslateCommand::execute () [override], [private], [virtual]`

Virtual method

Implements [s21::Command](#).

Definition at line 123 of file Model.cc.

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

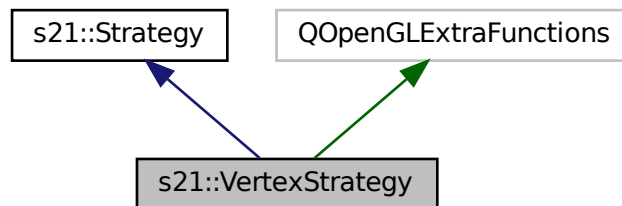
- include/Model.h
- sources/[Model.cc](#)

6.17 s21::VertexStrategy Class Reference

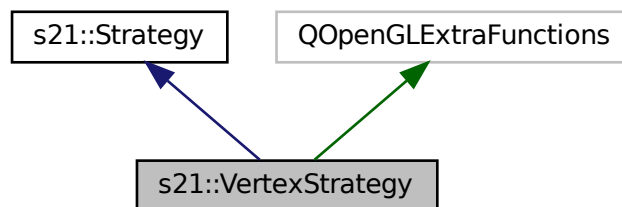
Implements vertex strategy rendering.

```
#include <OpenGLWidget.h>
```

Inheritance diagram for s21::VertexStrategy:



Collaboration diagram for s21::VertexStrategy:



Public Member Functions

- void **Render** (QtShader shader, const S21Matrix &mvp, const config &conf, const int &size) override

6.17.1 Detailed Description

Implements vertex strategy rendering.

Definition at line 50 of file OpenGLWidget.h.

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

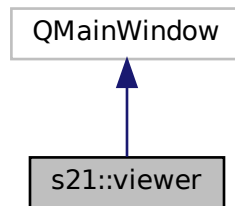
- include/OpenGLWidget.h
- sources/OpenGLWidget.cc

6.18 s21::viewer Class Reference

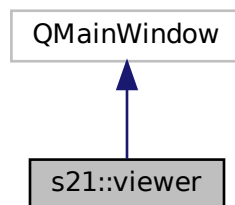
base vieweer class

```
#include <viewer.h>
```

Inheritance diagram for s21::viewer:



Collaboration diagram for s21::viewer:



Classes

- struct [obj](#)
Same result class as in model.

Signals

- void [OpenFileSignal](#) (const QString &filename)
- void [RotateMatrix](#) (float *, const std::vector< float > &)
- void [TranslateMatrix](#) (float *, const std::vector< float > &)
- void [ScaleMatrix](#) (float *, const float &)
- void [GetOrthoMatrix](#) (const float &, const float &, const float &, const float &, const float &, const float &)
- void [GetPerspectiveMatrix](#) (const float &, const float &, const float &, const float &)

Public Member Functions

- [viewer](#) (QWidget *parent=nullptr)
- [~viewer](#) () override
- void [SetError](#) (const std::string &message)
- void [SetResult](#) (const [obj](#) &input)
- void [SetResultMatrix](#) (float *result)

Static Public Attributes

- static constexpr char [config_filename](#) [] = "settings.conf"

Private Slots

- void [on_open_file_clicked](#) ()
- void [on_chooser_buttonClicked](#) (QAbstractButton *button)
- void [on_parallel_toggled](#) ()
- void [on_solid_toggled](#) ()
- void [on_vertices_btn_buttonClicked](#) ()
- void [on_size_num_valueChanged](#) ()
- void [on_move_clicked](#) ()
- void [on_rotate_clicked](#) ()
- void [on_scale_clicked](#) ()
- void [on_save_clicked](#) ()
- void [on_screencast_clicked](#) ()
- void [screencast_timer_tick](#) ()
- void [on_thickness_size_valueChanged](#) ()

Private Member Functions

- void [closeEvent](#) (QCloseEvent *event) override
- void [SetColor](#) (const QString &name, const QColor &color)
- void [OpenConfigFile](#) ()
- void [OpenFile](#) (const QString &filename)
- void [SetUiFromConfig](#) ()

Private Attributes

- bool [error](#) = false
- Ui::viewer * [ui](#)
- GifWriter [g](#)
- QTimer * [screencast_timer](#)
- int [counter](#) = 0

6.18.1 Detailed Description

base vieweer class

Definition at line 28 of file viewer.h.

6.18.2 Constructor & Destructor Documentation

6.18.2.1 viewer() `s21::viewer::viewer (QWidget * parent = nullptr) [explicit]`

Qt class ctor. Sets ui and connects

Parameters

| | |
|---------------|--|
| <i>parent</i> | |
|---------------|--|

Definition at line 18 of file viewer.cc.

6.18.2.2 ~viewer() `s21::viewer::~~viewer () [override]`

Corresponding dtor

Definition at line 35 of file viewer.cc.

6.18.3 Member Function Documentation

6.18.3.1 closeEvent() `void s21::viewer::closeEvent (
 QCloseEvent * event) [override], [private]`

Overriding close event to save config

Definition at line 86 of file viewer.cc.

6.18.3.2 GetOrthoMatrix `void s21::viewer::GetOrthoMatrix (
 const float & ,
 const float & ,
 const float & ,
 const float & ,
 const float & ,
 const float &) [signal]`

Signal to get Ortho matrix based in provided values

6.18.3.3 GetPerspectiveMatrix `void s21::viewer::GetPerspectiveMatrix (
 const float & ,
 const float & ,
 const float & ,
 const float &) [signal]`

Signal to get Perspective matrix based in provided values

6.18.3.4 OpenConfigFile() `void s21::viewer::OpenConfigFile () [private]`

Slot to open the config file amd get config

Definition at line 97 of file viewer.cc.

6.18.3.5 OpenFile() `void s21::viewer::OpenFile (
 const QString & filename) [private]`

Method to open the file from ui

Parameters

| | |
|-----------------|--------|
| <i>filename</i> | - file |
|-----------------|--------|

Definition at line 229 of file viewer.cc.

6.18.3.6 OpenFileSignal void s21::viewer::OpenFileSignal (
const QString & *filename*) [signal]

Signal to open the file

Parameters

| | |
|-----------------|--------|
| <i>filename</i> | - file |
|-----------------|--------|

6.18.3.7 RotateMatrix void s21::viewer::RotateMatrix (
float * ,
const std::vector< float > &) [signal]

Signal to rotate model matrix

Parameters

| | |
|-----------|--------------------|
| <i>mx</i> | - matrix to rotate |
| - | rotation vector |

6.18.3.8 ScaleMatrix void s21::viewer::ScaleMatrix (
float * ,
const float &) [signal]

Signal to scale model matrix

Parameters

| | |
|---------------|-------------------|
| <i>mx</i> | - matrix to scale |
| <i>factor</i> | - scale factor |

6.18.3.9 screencast_timer_tick void s21::viewer::screencast_timer_tick () [private], [slot]

Slot called by timer

Definition at line 195 of file viewer.cc.

6.18.3.10 SetColor() `void s21::viewer::SetColor (`
 `const QString & name,`
 `const QColor & color) [private]`

Method for setting color by name

Parameters

| | |
|--------------|--|
| <i>name</i> | |
| <i>color</i> | |

Definition at line 214 of file viewer.cc.

6.18.3.11 SetError() `void s21::viewer::SetError (`
 `const std::string & message)`

Public func to set error

Parameters

| | |
|----------------|-----------------|
| <i>message</i> | - error message |
|----------------|-----------------|

Definition at line 209 of file viewer.cc.

6.18.3.12 SetResult() `void s21::viewer::SetResult (`
 `const obj & input)`

Public func to set result

Parameters

| | |
|--------------|-----------------|
| <i>input</i> | - result object |
|--------------|-----------------|

Definition at line 224 of file viewer.cc.

6.18.3.13 SetResultMatrix() `void s21::viewer::SetResultMatrix (`
 `float * result)`

Public func to set result in opengl class

Parameters

| | |
|---------------|---------------------------|
| <i>result</i> | - result matrix to be set |
|---------------|---------------------------|

Definition at line 238 of file viewer.cc.

6.18.3.14 SetUiFromConfig() `void s2l::viewer::SetUiFromConfig () [private]`

Method for setting ui values from config

Definition at line 110 of file viewer.cc.

6.18.3.15 TranslateMatrix `void s2l::viewer::TranslateMatrix (float * , const std::vector< float > &) [signal]`

Signal to translate model matrix

Parameters

| | |
|------------|-----------------------|
| <i>mx</i> | - matrix to translate |
| <i>vec</i> | - translation vector |

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

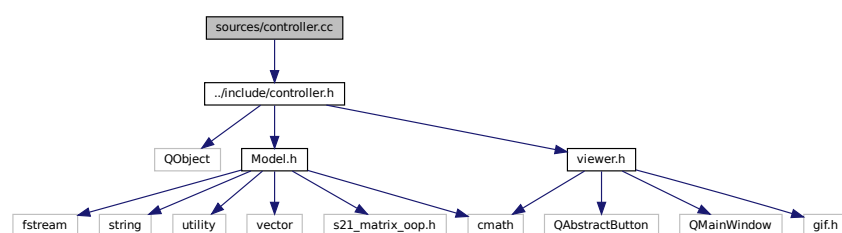
- include/viewer.h
- sources/[viewer.cc](#)

7 File Documentation

7.1 sources/controller.cc File Reference

```
#include "../include/controller.h"
```

Include dependency graph for controller.cc:

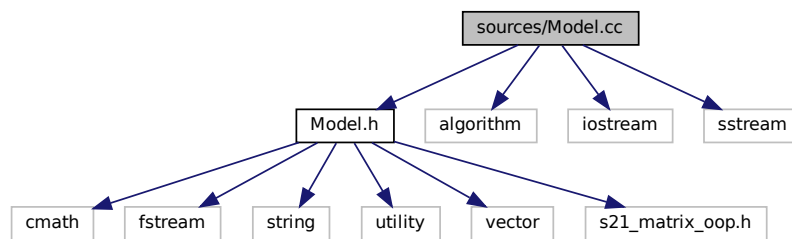


7.1.1 Detailed Description

controller class definitions

7.2 sources/Model.cc File Reference

```
#include "Model.h"  
#include <algorithm>  
#include <iostream>  
#include <sstream>  
Include dependency graph for Model.cc:
```

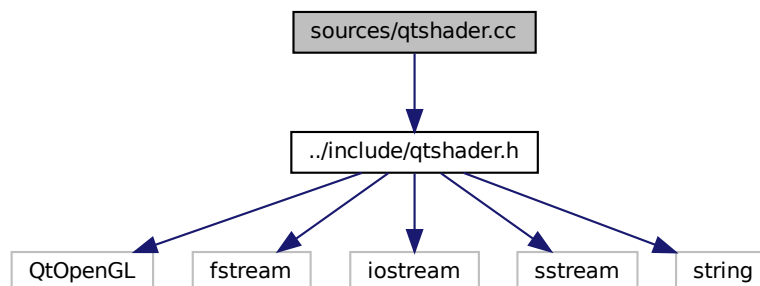


7.2.1 Detailed Description

- Model - part method's definitions

7.3 sources/qtshader.cc File Reference

```
#include "../include/qtshader.h"  
Include dependency graph for qtshader.cc:
```



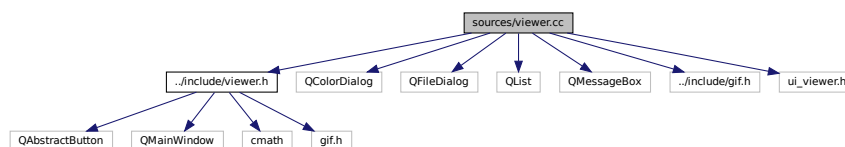
7.3.1 Detailed Description

- contains shader class' definitions

7.4 sources/viewer.cc File Reference

```
#include "../include/viewer.h"  
#include <QColorDialog>  
#include <QFileDialog>  
#include <QList>  
#include <QMessageBox>  
#include "../include/gif.h"  
#include "ui_viewer.h"
```

Include dependency graph for viewer.cc:



7.4.1 Detailed Description

- contains this class' definitions

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