

ODE Framework

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Chapter 5

Namespace Documentation

5.1 Package age

Packages

- package [clock](#)
- package [event](#)
- package [gui](#)
- package [log](#)
- package [port](#)
- package [scene](#)
- package [task](#)

Classes

- class [AGEException](#)
Root Exception for AGE.
- class [Client](#)
The AGE Application Client main class.
- class [Util](#)
The AGE Utility class.

5.2 Package age.clock

Classes

- class [Alarm](#)
This package visible class represents a single alarm schedule that periodically triggers a Task after a preset time period
- class [Clock](#)
The system Clock.
- interface [Task](#)
The Task interface that defines the call parameters for a Task reference method

5.3 Package age.event

Classes

- enum [Button](#)
Enumeration of Pointer Buttons.
- class [Event](#)
This class defines an Event along with its descriptive data.
- class [Events](#)
- interface [Handler](#)
Interface to define an event handler method reference.
- enum [Key](#)
Enumeration of Keyboard Keys.
- enum [Type](#)
Enumeration of Event Types to register to.

5.4 Package age.gui

Classes

- class [Dock](#)
- enum [Flag](#)
- class [Handling](#)
- class [Multiline](#)
- class [Rendering](#)
- class [VScroller](#)
- class [Widget](#)
- class [Widgets](#)
- class [Window](#)

5.5 Package age.log

Classes

- enum [Level](#)
Enumeration of Log Levels one can choose from that can be enabled/disabled separately.
- class [Log](#)
Class that provides configurable Logging capabilities.

5.6 Package age.port

Packages

- package [jogl](#)

Classes

- interface [Graphics](#)
- interface [Port](#)
- interface [Renderable](#)

5.7 Package age.port.jogl

Classes

- class [JOGLEventListener](#)
- class [JOGLGraphics](#)
- class [JOGLPort](#)
- class [JOGLRenderListener](#)

5.8 Package age.scene

Classes

- class [Camera](#)
- enum [Flag](#)
- class [Node](#)
- enum [Part](#)
- class [Rendering](#)
- class [Scene](#)

5.9 Package age.task

Classes

- interface [Task](#)
- class [Tasks](#)

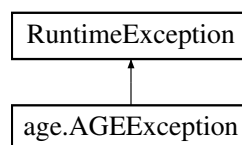
Chapter 6

Class Documentation

6.1 age.AGEEException Class Reference

Root Exception for AGE.

Inheritance diagram for age.AGEEException:



Public Member Functions

- [AGEEException](#) ()
Default Constructor.
- [AGEEException](#) (Throwable cause)
Constructor.
- [AGEEException](#) (String message)
Constructor.
- [AGEEException](#) (String message, Throwable cause)
Constructor.

Static Private Attributes

- static final long [serialVersionUID](#) = 1L
Default serial version number.

6.1.1 Detailed Description

Root Exception for AGE.

The AGEException is derived from Runtime Exception which means that no throws declarations have to be added to surrounding methods.

Exceptions of local try/catch blocks commonly are re-thrown by that Exception in order to make throws statements unnecessary.

6.1.2 Constructor & Destructor Documentation

6.1.2.1 AGEException() [1/4]

```
age.AGEException.AGEException ( )
```

Default Constructor.

6.1.2.2 AGEException() [2/4]

```
age.AGEException.AGEException (
    Throwable cause )
```

Constructor.

Parameters

<i>cause</i>	an Exception typically to be re-thrown.
--------------	---

6.1.2.3 AGEException() [3/4]

```
age.AGEException.AGEException (
    String message )
```

Constructor.

Parameters

<i>message</i>	A text message that is printed on the stack trace in case the Exception is thrown on application level.
----------------	---

6.1.2.4 AGEException() [4/4]

```
age.AGEException.AGEException (
    String message,
    Throwable cause )
```

Constructor.

Parameters

<i>message</i>	A text message that is printed on the stack trace in case the Exception is thrown on application level.
<i>cause</i>	an Exception typically to be re-thrown.

6.1.3 Member Data Documentation

6.1.3.1 serialVersionUID

```
final long age.AGEEException.serialVersionUID = 1L [static], [private]
```

Default serial version number.

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

- D:/GIT/repos/ODE/age/age/[AGEException.java](#)

6.2 age.clock.Alarm Class Reference

This package visible class represents a single alarm schedule that periodically triggers a Task after a preset time period

Public Member Functions

- void [init](#) (long nanotime)
Initializes the time measurement for this Alarm object.
- void [update](#) (long nanotime)
Updates the time measurement for this Alarm object and periodically triggers the Task after the time period has elapsed.

Package Functions

- [Alarm](#) (long [nanoperiod](#), Task task)
Package visible constructor.

Private Member Functions

- void [trigger](#) (int count, float dT)
Internal method that is called when the time period has elapsed and the task is to be triggered by this method.

Private Attributes

- long [nanoperiod](#)
The time period between triggers in nano seconds.
- Task [task](#)
The task that is triggered periodically after each nanoperiod.
- long [mark](#)
The time mark in nanoseconds to measure when a period elapses

6.2.1 Detailed Description

This package visible class represents a single alarm schedule that periodically triggers a Task after a preset time period

6.2.2 Constructor & Destructor Documentation

6.2.2.1 Alarm()

```
age.clock.Alarm.Alarm (
    long nanoperiod,
    Task task ) [package]
```

Package visible constructor.

Parameters

<i>nanoperiod</i>	the time period in nano seconds after which periodically the task is triggered
<i>task</i>	the task that is triggered periodically each time the nanoperiod time has elapsed

6.2.3 Member Function Documentation

6.2.3.1 init()

```
void age.clock.Alarm.init (
    long nanotime )
```

Initializes the time measurement for this Alarm object.

Parameters

<i>nanotime</i>	the current system time stamp in nano precision
-----------------	---

6.2.3.2 trigger()

```
void age.clock.Alarm.trigger (
    int count,
    float dT ) [private]
```

Internal method that is called when the time period has elapsed and the task is to be triggered by this method.

Parameters

<i>count</i>	the count of full time periods that did elapse since the last time the Task has been triggered. Normally the count is 1.
<i>dT</i>	the time in seconds since the last time the Task has been triggered.

6.2.3.3 update()

```
void age.clock.Alarm.update (
    long nanotime )
```

Updates the time measurement for this Alarm object and periodically triggers the Task after the time period has elapsed.

Parameters

<i>nanotime</i>	the current system time stamp in nano precision
-----------------	---

6.2.4 Member Data Documentation

6.2.4.1 mark

```
long age.clock.Alarm.mark [private]
```

The time mark in nanoseconds to measure when a period elapses

6.2.4.2 nanoperiod

```
long age.clock.Alarm.nanoperiod [private]
```

The time period between triggers in nano seconds.

6.2.4.3 task

```
Task age.clock.Alarm.task [private]
```

The task that is triggered periodically after each nanoperiod.

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

- D:/GIT/repos/ODE/age/age/clock/[Alarm.java](#)

6.3 age.event.Button Enum Reference

Enumeration of Pointer Buttons.

Public Attributes

- [NONE](#)
Literal representing "No Button".
- [BTN1](#)
Literal representing "Pointer Button 1".
- [BTN2](#)
Literal representing "Pointer Button 2".
- [BTN3](#)
Literal representing "Pointer Button 3".
- [BTN4](#)
Literal representing "Pointer Button 4".
- [BTN5](#)
Literal representing "Pointer Button 5".
- [BTN6](#)
Literal representing "Pointer Button 6".
- [BTN7](#)
Literal representing "Pointer Button 7".
- [BTN8](#)
Literal representing "Pointer Button 8".

6.3.1 Detailed Description

Enumeration of Pointer Buttons.

6.3.2 Member Data Documentation

6.3.2.1 BTN1

```
age.event.Button.BTN1
```

Literal representing "Pointer Button 1".

6.3.2.2 BTN2

```
age.event.Button.BTN2
```

Literal representing "Pointer Button 2".

6.3.2.3 BTN3

```
age.event.Button.BTN3
```

Literal representing "Pointer Button 3".

6.3.2.4 BTN4

```
age.event.Button.BTN4
```

Literal representing "Pointer Button 4".

6.3.2.5 BTN5

```
age.event.Button.BTN5
```

Literal representing "Pointer Button 5".

6.3.2.6 BTN6

```
age.event.Button.BTN6
```

Literal representing "Pointer Button 6".

6.3.2.7 BTN7

```
age.event.Button.BTN7
```

Literal representing "Pointer Button 7".

6.3.2.8 BTN8

```
age.event.Button.BTN8
```

Literal representing "Pointer Button 8".

6.3.2.9 NONE

```
age.event.Button.NONE
```

Literal representing "No Button".

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

- [D:/GIT/repos/ODE/age/age/event/Button.java](#)

6.4 age.scene.Camera Class Reference

Public Member Functions

- [Camera](#) (float [fovy](#), float [near](#), float [far](#))
- void [set](#) (float [fovy](#), float [near](#), float [far](#))

Public Attributes

- float [fovy](#)
- float [near](#)
- float [far](#)

6.4.1 Constructor & Destructor Documentation

6.4.1.1 Camera()

```
age.scene.Camera.Camera (
    float fovy,
    float near,
    float far )
```

6.4.2 Member Function Documentation

6.4.2.1 set()

```
void age.scene.Camera.set (
    float fovy,
    float near,
    float far )
```

6.4.3 Member Data Documentation

6.4.3.1 far

```
float age.scene.Camera.far
```

6.4.3.2 fovy

```
float age.scene.Camera.fovy
```

6.4.3.3 near

```
float age.scene.Camera.near
```

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

- [D:/GIT/repos/ODE/age/age/scene/Camera.java](#)

6.5 age.Client Class Reference

The AGE Application Client main class.

Public Member Functions

- void `run` ()
Initializes and executes the Client run loop.
- void `shutdown` ()
Sets the internal Client loop run state to false, and therefore stops the client run loop.

Static Public Member Functions

- static void `main` (String[] args)
The static Client main method to create a client instance and launch the application.

Private Member Functions

- void `setup` ()
Initializes the Client application and its parts.
- void `setupScene` ()
Sets up the initial 3D Scene.
- void `setupGUI` ()
Sets up the initial GUI elements.
- void `toggleSysmenu` ()
Private action method to toggle the visibility of the System Menu.
- void `toggleDesktop` ()
Private action method to toggle the visibility of the Desktop and its contents.
- void `loop` ()
The Client loop that maintains the program logic.
- void `render` (int count, long nanoperiod, float dT)
Private scheduler action to update the display contents and render the Client surface.
- void `update` (int count, long nanoperiod, float dT)
Private scheduler action to update the logic of the Client application.

Private Attributes

- Clock `clock` = new Clock()
The schedule clock.
- Events `events` = new Events()
The event system, handling and transforming input events.
- Scene `scene` = new Scene()
The 3D scene system.
- Widgets `widgets` = new Widgets()
The widget system (the GUI)
- Tasks `tasks` = new Tasks()
The task system.
- Port `port` = new JOGLPort()
The port system.
- boolean `running` = false
The run loop running indicator.
- Widget `sysMenuFrame`
Special internally used GUI Frame (The single System menu Button)
- Widget `windowFrame`
Special internally used GUI Frame (The invisible frame that serves as canvas for all GUI windows)

6.5.1 Detailed Description

The AGE Application Client main class.

6.5.2 Member Function Documentation

6.5.2.1 loop()

```
void age.Client.loop ( ) [private]
```

The Client loop that maintains the program logic.

6.5.2.2 main()

```
static void age.Client.main (
    String[] args ) [static]
```

The static Client main method to create a client instance and launch the application.

Parameters

<i>args</i>	Program arguments, unused atm.
-------------	--------------------------------

6.5.2.3 render()

```
void age.Client.render (
    int count,
    long nanoperiod,
    float dT ) [private]
```

Private scheduler action to update the display contents and render the Client surface.

Parameters

<i>count</i>	The number of (skipped) schedule frames since last call
<i>nanoperiod</i>	The duration of a schedule frame in nano seconds
<i>dT</i>	The time elapsed since last schedule call, in Seconds.

6.5.2.4 run()

```
void age.Client.run ( )
```

Initializes and executes the Client run loop.

6.5.2.5 setup()

```
void age.Client.setup ( ) [private]
```

Initializes the Client application and its parts.

6.5.2.6 setupGUI()

```
void age.Client.setupGUI ( ) [private]
```

Sets up the initial GUI elements.

6.5.2.7 setupScene()

```
void age.Client.setupScene ( ) [private]
```

Sets up the initial 3D Scene.

6.5.2.8 shutdown()

```
void age.Client.shutdown ( )
```

Sets the internal Client loop run state to false, and therefore stops the client run loop.

6.5.2.9 toggleDesktop()

```
void age.Client.toggleDesktop ( ) [private]
```

Private action method to toggle the visibility of the Desktop and its contents.

6.5.2.10 toggleSystemenu()

```
void age.Client.toggleSystemenu ( ) [private]
```

Private action method to toggle the visibility of the System Menu.

6.5.2.11 update()

```
void age.Client.update (
    int count,
    long nanoperiod,
    float dT ) [private]
```

Private scheduler action to update the logic of the Client application.

Parameters

<i>count</i>	The number of (skipped) schedule frames since last call
<i>nanoperiod</i>	The duration of a schedule frame in nano seconds
<i>dT</i>	The time elapsed since last schedule call, in Seconds.

6.5.3 Member Data Documentation

6.5.3.1 clock

```
Clock age.Client.clock = new Clock() [private]
```

The schedule clock.

6.5.3.2 events

```
Events age.Client.events = new Events() [private]
```

The event system, handling and transforming input events.

6.5.3.3 port

```
Port age.Client.port = new JOGLPort() [private]
```

The port system.

Provides and encapsulates the low level machine dependent parts of the Client application.

6.5.3.4 running

```
boolean age.Client.running = false [private]
```

The run loop running indicator.

6.5.3.5 scene

```
Scene age.Client.scene = new Scene() [private]
```

The 3D scene system.

6.5.3.6 sysMenuFrame

```
Widget age.Client.sysMenuFrame [private]
```

Special internally used GUI Frame (The single System menu Button)

6.5.3.7 tasks

```
Tasks age.Client.tasks = new Tasks() [private]
```

The task system.

Launches named tasks, that can be posted and queued, on a specific run loop phase.

6.5.3.8 widgets

```
Widgets age.Client.widgets = new Widgets() [private]
```

The widget system (the GUI)

6.5.3.9 windowFrame

```
Widget age.Client.windowFrame [private]
```

Special internally used GUI Frame (The invisible frame that serves as canvas for all GUI windows)

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

- D:/GIT/repos/ODE/age/age/[Client.java](#)

6.6 age.clock.Clock Class Reference

The system Clock.

Public Member Functions

- void [add](#) (long nanoperiod, [Task](#) task)
Method to add a Task to be periodically triggered after a given time period has elapsed.
- void [addFPS](#) (int fps, [Task](#) task)
Method to add a Task to be periodically triggered after a given time period has elapsed.
- void [init](#) ()
Initializes time measurement for all Alarm objects added to the Clock.
- void [update](#) ()
update time measurement for all Alarm objects added to the Clock, and indirectly triggers and executes Tasks when their Alarm period has elapsed.

Private Attributes

- final List< [Alarm](#) > [alarms](#) = new ArrayList<>()
The internal list to manage Alarm objects.

6.6.1 Detailed Description

The system Clock.

Normally only one instance of that clock is created per application. It manages and synchronizes multiple Alarm objects that each are responsible to manage the time periodic triggering of a specific Task

6.6.2 Member Function Documentation

6.6.2.1 add()

```
void age.clock.Clock.add (
    long nanoperiod,
    Task task )
```

Method to add a Task to be periodically triggered after a given time period has elapsed.

Parameters

<i>nanoperiod</i>	the time period in nano seconds after which the Task is triggered.
<i>task</i>	the Task to be triggered and executed.

6.6.2.2 addFPS()

```
void age.clock.Clock.addFPS (
    int fps,
    Task task )
```

Method to add a Task to be periodically triggered after a given time period has elapsed.

Parameters

<i>fps</i>	the trigger frames per second (i. e. how often the Task is triggered per second)
<i>task</i>	the Task to be triggered and executed.

6.6.2.3 init()

```
void age.clock.Clock.init ( )
```

Initializes time measurement for all Alarm objects added to the Clock.

6.6.2.4 update()

```
void age.clock.Clock.update ( )
```

update time measurement for all Alarm objects added to the Clock, and indirectly triggers and executes Tasks when their Alarm period has elapsed.

6.6.3 Member Data Documentation

6.6.3.1 alarms

```
final List<Alarm> age.clock.Clock.alarms = new ArrayList<>() [private]
```

The internal list to manage Alarm objects.

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

- [D:/GIT/repos/ODE/age/age/clock/Clock.java](#)

6.7 age.gui.Dock Class Reference

Public Member Functions

- float [top](#) ()
- float [bottom](#) ()
- float [left](#) ()
- float [right](#) ()
- void [set](#) ([Dock](#) dock)
- void [set](#) (float [left](#), float [right](#), float [top](#), float [bottom](#))

Private Attributes

- float [left](#) = 0
- float [right](#) = 0
- float [top](#) = 0
- float [bottom](#) = 0

6.7.1 Member Function Documentation

6.7.1.1 bottom()

```
float age.gui.Dock.bottom ( )
```

6.7.1.2 left()

```
float age.gui.Dock.left ( )
```

6.7.1.3 right()

```
float age.gui.Dock.right ( )
```

6.7.1.4 set() [1/2]

```
void age.gui.Dock.set (
    Dock dock )
```

6.7.1.5 set() [2/2]

```
void age.gui.Dock.set (
    float left,
    float right,
    float top,
    float bottom )
```

6.7.1.6 top()

```
float age.gui.Dock.top ( )
```

6.7.2 Member Data Documentation

6.7.2.1 bottom

```
float age.gui.Dock.bottom = 0 [private]
```

6.7.2.2 left

```
float age.gui.Dock.left = 0 [private]
```

6.7.2.3 right

```
float age.gui.Dock.right = 0 [private]
```

6.7.2.4 top

```
float age.gui.Dock.top = 0 [private]
```

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

- [D:/GIT/repos/ODE/age/age/gui/Dock.java](#)

6.8 age.event.Event Class Reference

This class defines an Event along with its descriptive data.

Public Member Functions

- void `clear` ()
Method to clear all event data values to default values.
- `Type` `type` ()
Method to clear all event data values to default values.
- `Key` `key` ()
- char `character` ()
- `Button` `button` ()
- int `count` ()
- float `x` ()
- float `y` ()
- Vector2f `position` ()
- float `width` ()
- float `height` ()
- Vector2f `dimension` ()
- String `command` ()
- void `keyPressed` (`Key` `key`, char `character`)
- void `keyReleased` (`Key` `key`, char `character`)
- void `keyTyped` (`Key` `key`, char `character`)
- void `pointerEntered` (float `x`, float `y`)
- void `pointerExited` (float `x`, float `y`)
- void `pointerMoved` (float `x`, float `y`)
- void `pointerPressed` (`Button` `button`, int `count`, float `x`, float `y`)
- void `pointerClicked` (`Button` `button`, int `count`, float `x`, float `y`)
- void `pointerReleased` (`Button` `button`, int `count`, float `x`, float `y`)
- void `surfaceResized` (float `w`, float `h`)
- void `surfaceCloseRequest` ()
- void `taskCommand` (String `command`)

Package Functions

- `Event` ()
Package visible constructor.

Private Member Functions

- void `keyEvent` (`Type` `type`, `Key` `key`, char `character`)
- void `pointerEvent` (`Type` `type`, `Button` `button`, int `count`, float `x`, float `y`)

Private Attributes

- `Type` `type` = `Type.NONE`
The event type.
- `Key` `key` = `Key.NONE`
The key for key event types.
- char `character` = `"0"`
The character typed for key event types.
- `Button` `button` = `Button.NONE`
The button for pointer event types.
- int `count` = `-1`

- The click count for pointer event types.*
 - Vector2f `position` = new Vector2f()
- The pointer position for pointer event types.*
 - Vector2f `dimension` = new Vector2f()
- The window dimension for the window resize event type.*
 - String `command` = null
- The command detail name for the command event type.*

6.8.1 Detailed Description

This class defines an Event along with its descriptive data.

6.8.2 Constructor & Destructor Documentation

6.8.2.1 Event()

```
age.event.Event.Event ( ) [package]
```

Package visible constructor.

6.8.3 Member Function Documentation

6.8.3.1 button()

```
Button age.event.Event.button ( )
```

6.8.3.2 character()

```
char age.event.Event.character ( )
```

6.8.3.3 clear()

```
void age.event.Event.clear ( )
```

Method to clear all event data values to default values.

6.8.3.4 command()

```
String age.event.Event.command ( )
```

6.8.3.5 count()

```
int age.event.Event.count ( )
```

6.8.3.6 dimension()

```
Vector2f age.event.Event.dimension ( )
```

6.8.3.7 height()

```
float age.event.Event.height ( )
```

6.8.3.8 key()

```
Key age.event.Event.key ( )
```

6.8.3.9 keyEvent()

```
void age.event.Event.keyEvent (
    Type type,
    Key key,
    char character ) [private]
```

6.8.3.10 keyPressed()

```
void age.event.Event.keyPressed (
    Key key,
    char character )
```

6.8.3.11 keyReleased()

```
void age.event.Event.keyReleased (
    Key key,
    char character )
```

6.8.3.12 keyTyped()

```
void age.event.Event.keyTyped (
    Key key,
    char character )
```

6.8.3.13 pointerClicked()

```
void age.event.Event.pointerClicked (
    Button button,
    int count,
    float x,
    float y )
```

6.8.3.14 pointerEntered()

```
void age.event.Event.pointerEntered (
    float x,
    float y )
```

6.8.3.15 pointerEvent()

```
void age.event.Event.pointerEvent (
    Type type,
    Button button,
    int count,
    float x,
    float y ) [private]
```

6.8.3.16 pointerExited()

```
void age.event.Event.pointerExited (
    float x,
    float y )
```

6.8.3.17 pointerMoved()

```
void age.event.Event.pointerMoved (
    float x,
    float y )
```

6.8.3.18 pointerPressed()

```
void age.event.Event.pointerPressed (
    Button button,
    int count,
    float x,
    float y )
```

6.8.3.19 pointerReleased()

```
void age.event.Event.pointerReleased (
    Button button,
    int count,
    float x,
    float y )
```

6.8.3.20 position()

```
Vector2f age.event.Event.position ( )
```

6.8.3.21 surfaceCloseRequest()

```
void age.event.Event.surfaceCloseRequest ( )
```

6.8.3.22 surfaceResized()

```
void age.event.Event.surfaceResized (
    float w,
    float h )
```

6.8.3.23 taskCommand()

```
void age.event.Event.taskCommand (
    String command )
```

6.8.3.24 type()

```
Type age.event.Event.type ( )
```

Method to clear all event data values to default values.

6.8.3.25 width()

```
float age.event.Event.width ( )
```

6.8.3.26 x()

```
float age.event.Event.x ( )
```

6.8.3.27 y()

```
float age.event.Event.y ( )
```

6.8.4 Member Data Documentation

6.8.4.1 button

```
Button age.event.Event.button = Button.NONE [private]
```

The button for pointer event types.

6.8.4.2 character

```
char age.event.Event.character = '\0' [private]
```

The character typed for key event types.

6.8.4.3 command

```
String age.event.Event.command = null [private]
```

The command detail name for the command event type.

6.8.4.4 count

```
int age.event.Event.count = -1 [private]
```

The click count for pointer event types.

6.8.4.5 dimension

```
Vector2f age.event.Event.dimension = new Vector2f() [private]
```

The window dimension for the window resize event type.

6.8.4.6 key

```
Key age.event.Event.key = Key.NONE [private]
```

The key for key event types.

6.8.4.7 position

```
Vector2f age.event.Event.position = new Vector2f() [private]
```

The pointer position for pointer event types.

6.8.4.8 type

```
Type age.event.Event.type = Type.NONE [private]
```

The event type.

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

- D:/GIT/repos/ODE/age/age/event/[Event.java](#)

6.9 age.event.Events Class Reference

Public Member Functions

- void [assign](#) ([Type](#) type, [Handler](#) handler)
- void [postKeyPressed](#) ([Key](#) key, char character)
- void [postKeyReleased](#) ([Key](#) key, char character)
- void [postKeyTyped](#) ([Key](#) key, char character)
- void [postPointerEntered](#) (float x, float y)
- void [postPointerExited](#) (float x, float y)
- void [postPointerMoved](#) (float x, float y)
- void [postPointerPressed](#) ([Button](#) button, int count, float x, float y)
- void [postPointerReleased](#) ([Button](#) button, int count, float x, float y)
- void [postPointerClicked](#) ([Button](#) button, int count, float x, float y)
- void [postSurfaceResized](#) (float w, float h)
- void [postSurfaceCloseRequest](#) ()
- void [postTaskCommand](#) (String command)
- void [update](#) ()

Private Member Functions

- void [handle](#) ([Event](#) event)
- void [post](#) ([Event](#) event)
- [Event](#) [alloc](#) ()
- void [free](#) ([Event](#) event)

Private Attributes

- final Queue< [Event](#) > [cache](#) = new LinkedList<>()
- final List< [Event](#) > [inbox](#) = new ArrayList<>()
- final List< [Event](#) > [outbox](#) = new ArrayList<>()
- final Map< [Type](#), List< [Handler](#) > > [handlers](#) = new EnumMap<>(Type.class)

6.9.1 Member Function Documentation

6.9.1.1 alloc()

```
Event age.event.Events.alloc ( ) [private]
```

6.9.1.2 assign()

```
void age.event.Events.assign (
    Type type,
    Handler handler )
```

6.9.1.3 free()

```
void age.event.Events.free (
    Event event ) [private]
```

6.9.1.4 handle()

```
void age.event.Events.handle (
    Event event ) [private]
```

6.9.1.5 post()

```
void age.event.Events.post (
    Event event ) [private]
```

6.9.1.6 postKeyPressed()

```
void age.event.Events.postKeyPressed (
    Key key,
    char character )
```

6.9.1.7 postKeyReleased()

```
void age.event.Events.postKeyReleased (
    Key key,
    char character )
```

6.9.1.8 postKeyTyped()

```
void age.event.Events.postKeyTyped (
    Key key,
    char character )
```

6.9.1.9 postPointerClicked()

```
void age.event.Events.postPointerClicked (
    Button button,
    int count,
    float x,
    float y )
```

6.9.1.10 postPointerEntered()

```
void age.event.Events.postPointerEntered (
    float x,
    float y )
```

6.9.1.11 postPointerExited()

```
void age.event.Events.postPointerExited (
    float x,
    float y )
```

6.9.1.12 postPointerMoved()

```
void age.event.Events.postPointerMoved (
    float x,
    float y )
```

6.9.1.13 postPointerPressed()

```
void age.event.Events.postPointerPressed (
    Button button,
    int count,
    float x,
    float y )
```

6.9.1.14 postPointerReleased()

```
void age.event.Events.postPointerReleased (
    Button button,
    int count,
    float x,
    float y )
```

6.9.1.15 postSurfaceCloseRequest()

```
void age.event.Events.postSurfaceCloseRequest ( )
```

6.9.1.16 postSurfaceResized()

```
void age.event.Events.postSurfaceResized (
    float w,
    float h )
```

6.9.1.17 postTaskCommand()

```
void age.event.Events.postTaskCommand (
    String command )
```

6.9.1.18 update()

```
void age.event.Events.update ( )
```

6.9.2 Member Data Documentation

6.9.2.1 cache

```
final Queue<Event> age.event.Events.cache = new LinkedList<>() [private]
```

6.9.2.2 handlers

```
final Map<Type, List<Handler> > age.event.Events.handlers = new EnumMap<>(Type.class) [private]
```

6.9.2.3 inbox

```
final List<Event> age.event.Events.inbox = new ArrayList<>() [private]
```

6.9.2.4 outbox

```
final List<Event> age.event.Events.outbox = new ArrayList<>() [private]
```

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

- [D:/GIT/repos/ODE/age/age/event/Events.java](#)

6.10 age.gui.Flag Enum Reference

Public Attributes

- [BOX](#)
- [FRAME](#)
- [BUTTON](#)
- [CANVAS](#)
- [TITLE](#)
- [MULTILINE](#)
- [HANDLE](#)
- [HIDDEN](#)
- [HOVERED](#)

6.10.1 Member Data Documentation

6.10.1.1 BOX

```
age.gui.Flag.BOX
```

6.10.1.2 BUTTON

```
age.gui.Flag.BUTTON
```

6.10.1.3 CANVAS

```
age.gui.Flag.CANVAS
```

6.10.1.4 FRAME

```
age.gui.Flag.FRAME
```

6.10.1.5 HANDLE

```
age.gui.Flag.HANDLE
```

6.10.1.6 HIDDEN

```
age.gui.Flag.HIDDEN
```

6.10.1.7 HOVERED

```
age.gui.Flag.HOVERED
```

6.10.1.8 MULTILINE

```
age.gui.Flag.MULTILINE
```

6.10.1.9 TITLE

```
age.gui.Flag.TITLE
```

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

- [D:/GIT/repos/ODE/age/age/gui/Flag.java](#)

6.11 age.scene.Flag Enum Reference

Public Attributes

- [BOX](#)

6.11.1 Member Data Documentation

6.11.1.1 BOX

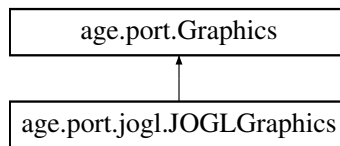
```
age.scene.Flag.BOX
```

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

- [D:/GIT/repos/ODE/age/age/scene/Flag.java](#)

6.12 age.port.Graphics Interface Reference

Inheritance diagram for age.port.Graphics:



Public Member Functions

- void [mode3D](#) (float fovy, float near, float far)
- void [mode2D](#) ()
- void [pushTransformation](#) ()
- void [popTransformation](#) ()
- void [applyTransformation](#) (Matrix4f matrix)
- void [translate](#) (Vector2f pos)
- void [translate](#) (float x, float y)
- void [color](#) (Color4f c)
- void [color](#) (float r, float g, float b)
- void [color](#) (float r, float g, float b, float a)
- void [rectangle](#) (Vector2f dim, boolean hollow)
- void [rectangle](#) (Vector2f pos, Vector2f dim, boolean hollow)
- void [rectangle](#) (float x, float y, float w, float h, boolean hollow)
- void [text](#) (float x, float y, CharSequence text, String font)
- void [texture](#) (float x, float y, float w, float h, String texture)
- void [calcMultitext](#) (String [text](#), Vector2f dimension, String font, int[] buffer)
- void [calcMultitext](#) (String [text](#), float width, float height, String font, int[] buffer)
- void [drawBox](#) (float sx, float sy, float sz)

6.12.1 Member Function Documentation

6.12.1.1 [applyTransformation\(\)](#)

```
void age.port.Graphics.applyTransformation (
    Matrix4f matrix )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.2 [calcMultitext\(\)](#) [1/2]

```
void age.port.Graphics.calcMultitext (
    String text,
    float width,
    float height,
    String font,
    int[] buffer )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.3 calcMultitext() [2/2]

```
void age.port.Graphics.calcMultitext (
    String text,
    Vector2f dimension,
    String font,
    int[] buffer )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.4 color() [1/3]

```
void age.port.Graphics.color (
    Color4f c )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.5 color() [2/3]

```
void age.port.Graphics.color (
    float r,
    float g,
    float b )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.6 color() [3/3]

```
void age.port.Graphics.color (
    float r,
    float g,
    float b,
    float a )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.7 drawBox()

```
void age.port.Graphics.drawBox (
    float sx,
    float sy,
    float sz )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.8 mode2D()

```
void age.port.Graphics.mode2D ( )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.9 mode3D()

```
void age.port.Graphics.mode3D (
    float fovy,
    float near,
    float far )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.10 popTransformation()

```
void age.port.Graphics.popTransformation ( )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.11 pushTransformation()

```
void age.port.Graphics.pushTransformation ( )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.12 rectangle() [1/3]

```
void age.port.Graphics.rectangle (
    float x,
    float y,
    float w,
    float h,
    boolean hollow )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.13 rectangle() [2/3]

```
void age.port.Graphics.rectangle (
    Vector2f dim,
    boolean hollow )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.14 rectangle() [3/3]

```
void age.port.Graphics.rectangle (
    Vector2f pos,
    Vector2f dim,
    boolean hollow )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.15 text()

```
void age.port.Graphics.text (
    float x,
    float y,
    CharSequence text,
    String font )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.16 texture()

```
void age.port.Graphics.texture (
    float x,
    float y,
    float w,
    float h,
    String texture )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.17 translate() [1/2]

```
void age.port.Graphics.translate (
    float x,
    float y )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

6.12.1.18 translate() [2/2]

```
void age.port.Graphics.translate (
    Vector2f pos )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

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

- [D:/GIT/repos/ODE/age/age/port/Graphics.java](#)

6.13 age.event.Handler Interface Reference

Interface to define an event handler method reference.

Public Member Functions

- void [handle](#) ([Event](#) event)

The event handler method reference definition.

6.13.1 Detailed Description

Interface to define an event handler method reference.

6.13.2 Member Function Documentation

6.13.2.1 handle()

```
void age.event.Handler.handle (
    Event event )
```

The event handler method reference definition.

Parameters

<i>event</i>	The event object to describe the event
--------------	--

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

- [D:/GIT/repos/ODE/age/age/event/Handler.java](#)

6.14 age.gui.Handling Class Reference

Public Member Functions

- [Handling](#) ([Widgets](#) [widgets](#))
- void [assign](#) ([Events](#) [events](#))
- void [handleKeyboard](#) ([Event](#) [e](#))
- void [handlePointer](#) ([Event](#) [e](#))
- void [handleSurface](#) ([Event](#) [e](#))

Private Member Functions

- void [pressedFrameToFront](#) ([Event](#) [e](#))
- void [buttonClickAction](#) ([Event](#) [e](#))
- void [startFrameSizeAction](#) ([Event](#) [e](#))
- void [startFrameDragAction](#) ([Event](#) [e](#))
- void [startScrollHandleAction](#) ([Event](#) [e](#))
- void [updateActionState](#) ([Event](#) [e](#), [String](#) [action](#))
- void [updateDragAction](#) ([Event](#) [e](#))
- void [stopDragAction](#) ([Event](#) [e](#))
- [Widget hovered](#) ([Vector2f](#) [pos](#), [Widget](#) [widget](#))

Private Attributes

- Events [events](#)
- final [Widgets](#) [widgets](#)
- [Widget](#) [hovered](#) = null
- [Widget](#) [dragged](#) = null
- String [action](#) = null
- final [Vector2f](#) [ref](#) = new [Vector2f](#)()
- final [Vector2f](#) [tmp](#) = new [Vector2f](#)()

6.14.1 Constructor & Destructor Documentation

6.14.1.1 Handling()

```
age.gui.Handling.Handling (
    Widgets widgets )
```

6.14.2 Member Function Documentation

6.14.2.1 assign()

```
void age.gui.Handling.assign (
    Events events )
```

6.14.2.2 buttonClickAction()

```
void age.gui.Handling.buttonClickAction (
    Event e ) [private]
```

6.14.2.3 handleKeyboard()

```
void age.gui.Handling.handleKeyboard (
    Event e )
```

6.14.2.4 handlePointer()

```
void age.gui.Handling.handlePointer (
    Event e )
```

6.14.2.5 handleSurface()

```
void age.gui.Handling.handleSurface (
    Event e )
```

6.14.2.6 hovered()

```
Widget age.gui.Handling.hovered (
    Vector2f pos,
    Widget widget ) [private]
```

6.14.2.7 pressedFrameToFront()

```
void age.gui.Handling.pressedFrameToFront (
    Event e ) [private]
```

6.14.2.8 startFrameDragAction()

```
void age.gui.Handling.startFrameDragAction (
    Event e ) [private]
```

6.14.2.9 startFrameSizeAction()

```
void age.gui.Handling.startFrameSizeAction (
    Event e ) [private]
```

6.14.2.10 startScrollHandleAction()

```
void age.gui.Handling.startScrollHandleAction (
    Event e ) [private]
```

6.14.2.11 stopDragAction()

```
void age.gui.Handling.stopDragAction (
    Event e ) [private]
```

6.14.2.12 updateActionState()

```
void age.gui.Handling.updateActionState (
    Event e,
    String action ) [private]
```

6.14.2.13 updateDragAction()

```
void age.gui.Handling.updateDragAction (
    Event e ) [private]
```

6.14.3 Member Data Documentation

6.14.3.1 action

```
String age.gui.Handling.action = null [private]
```

6.14.3.2 dragged

```
Widget age.gui.Handling.dragged = null [private]
```

6.14.3.3 events

```
Events age.gui.Handling.events [private]
```

6.14.3.4 hovered

```
Widget age.gui.Handling.hovered = null [private]
```

6.14.3.5 ref

```
final Vector2f age.gui.Handling.ref = new Vector2f() [private]
```

6.14.3.6 tmp

```
final Vector2f age.gui.Handling.tmp = new Vector2f() [private]
```

6.14.3.7 widgets

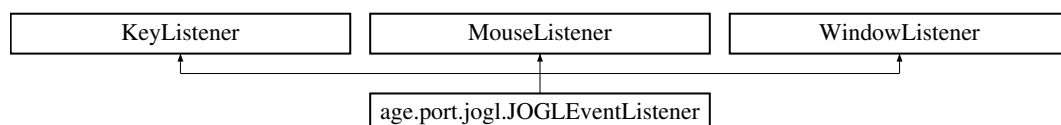
```
final Widgets age.gui.Handling.widgets [private]
```

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

- [D:/GIT/repos/ODE/age/age/gui/Handling.java](#)

6.15 age.port.jogl.JOGLEventListener Class Reference

Inheritance diagram for age.port.jogl.JOGLEventListener:



Public Member Functions

- void [assign](#) (Events [events](#))
- void [mouseClicked](#) (MouseEvent [e](#))
- void [mouseEntered](#) (MouseEvent [e](#))
- void [mouseExited](#) (MouseEvent [e](#))
- void [mousePressed](#) (MouseEvent [e](#))
- void [mouseReleased](#) (MouseEvent [e](#))
- void [mouseMoved](#) (MouseEvent [e](#))
- void [mouseDragged](#) (MouseEvent [e](#))
- void [mouseWheelMoved](#) (MouseEvent [e](#))
- void [keyPressed](#) (KeyEvent [e](#))
- void [keyReleased](#) (KeyEvent [e](#))
- void [windowResized](#) (WindowEvent [e](#))
- void [windowMoved](#) (WindowEvent [e](#))
- void [windowDestroyNotify](#) (WindowEvent [e](#))
- void [windowDestroyed](#) (WindowEvent [e](#))
- void [windowGainedFocus](#) (WindowEvent [e](#))
- void [windowLostFocus](#) (WindowEvent [e](#))
- void [windowRepaint](#) (WindowUpdateEvent [e](#))

Private Member Functions

- void [handleSurfaceCloseRequest](#) (Event [e](#))
- Button [translateButton](#) (short [button](#))
- Key [translateKey](#) (short [key](#))

Private Attributes

- Events [events](#) = null

6.15.1 Member Function Documentation

6.15.1.1 [assign\(\)](#)

```
void age.port.jogl.JOGLEventListener.assign (  
    Events events )
```

6.15.1.2 [handleSurfaceCloseRequest\(\)](#)

```
void age.port.jogl.JOGLEventListener.handleSurfaceCloseRequest (  
    Event e ) [private]
```

6.15.1.3 [keyPressed\(\)](#)

```
void age.port.jogl.JOGLEventListener.keyPressed (  
    KeyEvent e )
```

6.15.1.4 keyReleased()

```
void age.port.jogl.JOGLEventListener.keyReleased (
    KeyEvent e )
```

6.15.1.5 mouseClicked()

```
void age.port.jogl.JOGLEventListener.mouseClicked (
    MouseEvent e )
```

6.15.1.6 mouseDragged()

```
void age.port.jogl.JOGLEventListener.mouseDragged (
    MouseEvent e )
```

6.15.1.7 mouseEntered()

```
void age.port.jogl.JOGLEventListener.mouseEntered (
    MouseEvent e )
```

6.15.1.8 mouseExited()

```
void age.port.jogl.JOGLEventListener.mouseExited (
    MouseEvent e )
```

6.15.1.9 mouseMoved()

```
void age.port.jogl.JOGLEventListener.mouseMoved (
    MouseEvent e )
```

6.15.1.10 mousePressed()

```
void age.port.jogl.JOGLEventListener.mousePressed (
    MouseEvent e )
```

6.15.1.11 mouseReleased()

```
void age.port.jogl.JOGLEventListener.mouseReleased (
    MouseEvent e )
```

6.15.1.12 mouseWheelMoved()

```
void age.port.jogl.JOGLEventListener.mouseWheelMoved (
    MouseEvent e )
```

6.15.1.13 translateButton()

```
Button age.port.jogl.JOGLEventListener.translateButton (
    short button ) [private]
```

6.15.1.14 translateKey()

```
Key age.port.jogl.JOGLEventListener.translateKey (
    short key ) [private]
```

6.15.1.15 windowDestroyed()

```
void age.port.jogl.JOGLEventListener.windowDestroyed (
    WindowEvent e )
```

6.15.1.16 windowDestroyNotify()

```
void age.port.jogl.JOGLEventListener.windowDestroyNotify (
    WindowEvent e )
```

6.15.1.17 windowGainedFocus()

```
void age.port.jogl.JOGLEventListener.windowGainedFocus (
    WindowEvent e )
```

6.15.1.18 windowLostFocus()

```
void age.port.jogl.JOGLEventListener.windowLostFocus (
    WindowEvent e )
```

6.15.1.19 windowMoved()

```
void age.port.jogl.JOGLEventListener.windowMoved (
    WindowEvent e )
```

6.15.1.20 windowRepaint()

```
void age.port.jogl.JOGLEventListener.windowRepaint (
    WindowUpdateEvent e )
```

6.15.1.21 windowResized()

```
void age.port.jogl.JOGLEventListener.windowResized (
    WindowEvent e )
```


6.15.2 Member Data Documentation

6.15.2.1 events

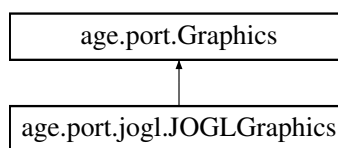
Events `age.port.jogl.JOGLEventListener.events = null` [private]

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

- [D:/GIT/repos/ODE/age/age/port/jogl/JOGLEventListener.java](#)

6.16 age.port.jogl.JOGLGraphics Class Reference

Inheritance diagram for `age.port.jogl.JOGLGraphics`:



Public Member Functions

- void [assign](#) (GLAutoDrawable [drawable](#))
- void [init](#) ()
- void [clear](#) ()
- void [mode3D](#) (float fovy, float near, float far)
- void [mode2D](#) ()
- void [pushTransformation](#) ()
- void [popTransformation](#) ()
- void [applyTransformation](#) (Matrix4f matrix)
- void [translate](#) (Vector2f t)
- void [translate](#) (float x, float y)
- void [color](#) (Color4f c)
- void [color](#) (float r, float g, float b)
- void [color](#) (float r, float g, float b, float a)
- void [rectangle](#) (Vector2f dim, boolean hollow)
- void [rectangle](#) (Vector2f pos, Vector2f dim, boolean hollow)
- void [rectangle](#) (float x, float y, float w, float h, boolean hollow)
- void [text](#) (float x, float y, CharSequence text, String font)
- void [texture](#) (float x, float y, float w, float h, String texture)
- void [calcMultitext](#) (String [text](#), Vector2f dimension, String font, int[] [buffer](#))
- void [calcMultitext](#) (String [text](#), float width, float height, String font, int[] [buffer](#))
- void [drawBox](#) (float sx, float sy, float sz)

Private Attributes

- GLAutoDrawable [drawable](#) = null
- GL2 [gl](#) = null
- GLU [glu](#) = null
- Map< String, Texture > [textures](#) = new HashMap<>()
- Map< String, TextRenderer > [fonts](#) = new HashMap<>()
- float[] [buffer](#) = new float[16]

6.16.1 Member Function Documentation

6.16.1.1 `applyTransformation()`

```
void age.port.jogl.JOGLGraphics.applyTransformation (
    Matrix4f matrix )
```

Implements [age.port.Graphics](#).

6.16.1.2 `assign()`

```
void age.port.jogl.JOGLGraphics.assign (
    GLAutoDrawable drawable )
```

6.16.1.3 `calcMultitext()` [1/2]

```
void age.port.jogl.JOGLGraphics.calcMultitext (
    String text,
    float width,
    float height,
    String font,
    int[] buffer )
```

Implements [age.port.Graphics](#).

6.16.1.4 `calcMultitext()` [2/2]

```
void age.port.jogl.JOGLGraphics.calcMultitext (
    String text,
    Vector2f dimension,
    String font,
    int[] buffer )
```

Implements [age.port.Graphics](#).

6.16.1.5 `clear()`

```
void age.port.jogl.JOGLGraphics.clear ( )
```

6.16.1.6 `color()` [1/3]

```
void age.port.jogl.JOGLGraphics.color (
    Color4f c )
```

Implements [age.port.Graphics](#).

6.16.1.7 color() [2/3]

```
void age.port.jogl.JOGLGraphics.color (
    float r,
    float g,
    float b )
```

Implements [age.port.Graphics](#).

6.16.1.8 color() [3/3]

```
void age.port.jogl.JOGLGraphics.color (
    float r,
    float g,
    float b,
    float a )
```

Implements [age.port.Graphics](#).

6.16.1.9 drawBox()

```
void age.port.jogl.JOGLGraphics.drawBox (
    float sx,
    float sy,
    float sz )
```

Implements [age.port.Graphics](#).

6.16.1.10 init()

```
void age.port.jogl.JOGLGraphics.init ( )
```

6.16.1.11 mode2D()

```
void age.port.jogl.JOGLGraphics.mode2D ( )
```

Implements [age.port.Graphics](#).

6.16.1.12 mode3D()

```
void age.port.jogl.JOGLGraphics.mode3D (
    float fovy,
    float near,
    float far )
```

Implements [age.port.Graphics](#).

6.16.1.13 popTransformation()

```
void age.port.jogl.JOGLGraphics.popTransformation ( )
```

Implements [age.port.Graphics](#).

6.16.1.14 pushTransformation()

```
void age.port.jogl.JOGLGraphics.pushTransformation ( )
```

Implements [age.port.Graphics](#).

6.16.1.15 rectangle() [1/3]

```
void age.port.jogl.JOGLGraphics.rectangle (
    float x,
    float y,
    float w,
    float h,
    boolean hollow )
```

Implements [age.port.Graphics](#).

6.16.1.16 rectangle() [2/3]

```
void age.port.jogl.JOGLGraphics.rectangle (
    Vector2f dim,
    boolean hollow )
```

Implements [age.port.Graphics](#).

6.16.1.17 rectangle() [3/3]

```
void age.port.jogl.JOGLGraphics.rectangle (
    Vector2f pos,
    Vector2f dim,
    boolean hollow )
```

Implements [age.port.Graphics](#).

6.16.1.18 text()

```
void age.port.jogl.JOGLGraphics.text (
    float x,
    float y,
    CharSequence text,
    String font )
```

Implements [age.port.Graphics](#).

6.16.1.19 texture()

```
void age.port.jogl.JOGLGraphics.texture (
    float x,
    float y,
    float w,
    float h,
    String texture )
```

Implements [age.port.Graphics](#).

6.16.1.20 translate() [1/2]

```
void age.port.jogl.JOGLGraphics.translate (
    float x,
    float y )
```

Implements [age.port.Graphics](#).

6.16.1.21 translate() [2/2]

```
void age.port.jogl.JOGLGraphics.translate (
    Vector2f t )
```

Implements [age.port.Graphics](#).

6.16.2 Member Data Documentation

6.16.2.1 buffer

```
float [] age.port.jogl.JOGLGraphics.buffer = new float[16] [private]
```

6.16.2.2 drawable

```
GLAutoDrawable age.port.jogl.JOGLGraphics.drawable = null [private]
```

6.16.2.3 fonts

```
Map<String, TextRenderer> age.port.jogl.JOGLGraphics.fonts = new HashMap<>() [private]
```

6.16.2.4 gl

```
GL2 age.port.jogl.JOGLGraphics.gl = null [private]
```

6.16.2.5 glu

```
GLU age.port.jogl.JOGLGraphics.glu = null [private]
```

6.16.2.6 textures

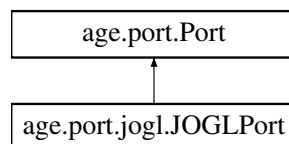
```
Map<String, Texture> age.port.jogl.JOGLGraphics.textures = new HashMap<>() [private]
```

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

- [D:/GIT/repos/ODE/age/age/port/jogl/JOGLGraphics.java](#)

6.17 age.port.jogl.JOGLPort Class Reference

Inheritance diagram for age.port.jogl.JOGLPort:



Public Member Functions

- void [assign](#) (Events events)
- String [title](#) ()
- void [title](#) (String title)
- boolean [maximized](#) ()
- void [maximized](#) (boolean maximized)
- boolean [fullscreen](#) ()
- void [fullscreen](#) (boolean fullscreen)
- boolean [visible](#) ()
- void [visible](#) (boolean visible)
- float [width](#) ()
- float [height](#) ()
- void [size](#) (float [width](#), float [height](#))
- void [add](#) (Renderable renderable)
- List< [Renderable](#) > [get](#) ()
- void [create](#) ()
- void [render](#) ()

Private Attributes

- GLWindow [window](#) = null
- JOGLEventListener [eventListener](#) = null
- JOGLRenderListener [renderListener](#) = null
- final List< [Renderable](#) > [renderables](#) = new ArrayList<>()
- final List< [Renderable](#) > [renderables_ro](#) = Collections.unmodifiableList([renderables](#))

6.17.1 Member Function Documentation

6.17.1.1 add()

```
void age.port.jogl.JOGLPort.add (
    Renderable renderable )
```

Implements [age.port.Port](#).

6.17.1.2 assign()

```
void age.port.jogl.JOGLPort.assign (
    Events events )
```

Implements [age.port.Port](#).

6.17.1.3 create()

```
void age.port.jogl.JOGLPort.create ( )
```

Implements [age.port.Port](#).

6.17.1.4 fullscreen() [1/2]

```
boolean age.port.jogl.JOGLPort.fullscreen ( )
```

Implements [age.port.Port](#).

6.17.1.5 fullscreen() [2/2]

```
void age.port.jogl.JOGLPort.fullscreen (
    boolean fullscreen )
```

Implements [age.port.Port](#).

6.17.1.6 get()

```
List< Renderable > age.port.jogl.JOGLPort.get ( )
```

6.17.1.7 height()

```
float age.port.jogl.JOGLPort.height ( )
```

Implements [age.port.Port](#).

6.17.1.8 maximized() [1/2]

```
boolean age.port.jogl.JOGLPort.maximized ( )
```

Implements [age.port.Port](#).

6.17.1.9 maximized() [2/2]

```
void age.port.jogl.JOGLPort.maximized (
    boolean maximized )
```

Implements [age.port.Port](#).

6.17.1.10 render()

```
void age.port.jogl.JOGLPort.render ( )
```

Implements [age.port.Port](#).

6.17.1.11 size()

```
void age.port.jogl.JOGLPort.size (
    float width,
    float height )
```

Implements [age.port.Port](#).

6.17.1.12 title() [1/2]

```
String age.port.jogl.JOGLPort.title ( )
```

Implements [age.port.Port](#).

6.17.1.13 title() [2/2]

```
void age.port.jogl.JOGLPort.title (
    String title )
```

Implements [age.port.Port](#).

6.17.1.14 visible() [1/2]

```
boolean age.port.jogl.JOGLPort.visible ( )
```

Implements [age.port.Port](#).

6.17.1.15 visible() [2/2]

```
void age.port.jogl.JOGLPort.visible (
    boolean visible )
```

Implements [age.port.Port](#).

6.17.1.16 width()

```
float age.port.jogl.JOGLPort.width ( )
```

Implements [age.port.Port](#).

6.17.2 Member Data Documentation

6.17.2.1 eventListener

```
JOGLEventListener age.port.jogl.JOGLPort.eventListener = null [private]
```

6.17.2.2 renderables

```
final List<Renderable> age.port.jogl.JOGLPort.renderables = new ArrayList<>() [private]
```

6.17.2.3 renderables_ro

```
final List<Renderable> age.port.jogl.JOGLPort.renderables_ro = Collections.unmodifiable←  
List(renderables) [private]
```

6.17.2.4 renderListener

```
JOGLRenderListener age.port.jogl.JOGLPort.renderListener = null [private]
```

6.17.2.5 window

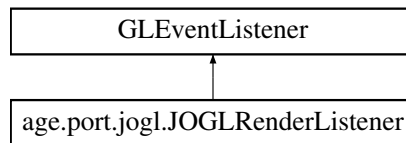
```
GLWindow age.port.jogl.JOGLPort.window = null [private]
```

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

- D:/GIT/repos/ODE/age/age/port/jogl/[JOGLPort.java](#)

6.18 age.port.jogl.JOGLRenderListener Class Reference

Inheritance diagram for age.port.jogl.JOGLRenderListener:



Public Member Functions

- [JOGLRenderListener](#) ([JOGLPort](#) port)
- void [init](#) (GLAutoDrawable drawable)
- void [reshape](#) (GLAutoDrawable drawable, int x, int y, int width, int height)
- void [display](#) (GLAutoDrawable drawable)
- void [dispose](#) (GLAutoDrawable drawable)

Private Attributes

- final [JOGLPort](#) port
- final [JOGLGraphics](#) graphics

6.18.1 Constructor & Destructor Documentation

6.18.1.1 JOGLRenderListener()

```
age.port.jogl.JOGLRenderListener.JOGLRenderListener (
    JOGLPort port )
```

6.18.2 Member Function Documentation

6.18.2.1 display()

```
void age.port.jogl.JOGLRenderListener.display (
    GLAutoDrawable drawable )
```

6.18.2.2 dispose()

```
void age.port.jogl.JOGLRenderListener.dispose (
    GLAutoDrawable drawable )
```

6.18.2.3 init()

```
void age.port.jogl.JOGLRenderListener.init (
    GLAutoDrawable drawable )
```

6.18.2.4 reshape()

```
void age.port.jogl.JOGLRenderListener.reshape (
    GLAutoDrawable drawable,
    int x,
    int y,
    int width,
    int height )
```

6.18.3 Member Data Documentation

6.18.3.1 graphics

```
final JOGLGraphics age.port.jogl.JOGLRenderListener.graphics [private]
```

6.18.3.2 port

```
final JOGLPort age.port.jogl.JOGLRenderListener.port [private]
```

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

- [D:/GIT/repos/ODE/age/age/port/jogl/JOGLRenderListener.java](#)

6.19 age.event.Key Enum Reference

Enumeration of Keyboard Keys.

Public Attributes

- [NONE](#)
Literal representing "No Key".
- [ESCAPE](#)
- [F1](#)
- [F2](#)
- [F3](#)
- [F4](#)
- [F5](#)
- [F6](#)
- [F7](#)
- [F8](#)
- [F9](#)
- [F10](#)
- [F11](#)
- [F12](#)
- [PRINT_SCREEN](#)
- [SCROLL_LOCK](#)
- [PAUSE](#)
- [_1](#)

- [_2](#)
- [_3](#)
- [_4](#)
- [_5](#)
- [_6](#)
- [_7](#)
- [_8](#)
- [_9](#)
- [_0](#)
- [BACK_SPACE](#)
- [TAB](#)
- [ENTER](#)
- [SPACE](#)
- [Q](#)
- [W](#)
- [E](#)
- [R](#)
- [T](#)
- [Z](#)
- [U](#)
- [I](#)
- [O](#)
- [P](#)
- [A](#)
- [S](#)
- [D](#)
- [F](#)
- [G](#)
- [H](#)
- [J](#)
- [K](#)
- [L](#)
- [Y](#)
- [X](#)
- [C](#)
- [V](#)
- [B](#)
- [N](#)
- [M](#)
- [PLUS](#)
- [MINUS](#)
- [CAPS_LOCK](#)
- [SHIFT](#)
- [CONTROL](#)
- [SYSTEM](#)
- [ALT](#)
- [MENU](#)
- [INSERT](#)
- [DELETE](#)
- [POS1](#)
- [END](#)
- [PAGE_UP](#)
- [PAGE_DOWN](#)
- [UP](#)
- [DOWN](#)

- [LEFT](#)
- [RIGHT](#)
- [NUM_LOCK](#)
- [DIVIDE](#)
- [MULTIPLY](#)
- [SUBTRACT](#)
- [ADD](#)
- [DECIMAL](#)
- [NP_7](#)
- [NP_8](#)
- [NP_9](#)
- [NP_4](#)
- [NP_5](#)
- [NP_6](#)
- [NP_1](#)
- [NP_2](#)
- [NP_3](#)
- [NP_0](#)

6.19.1 Detailed Description

Enumeration of Keyboard Keys.

6.19.2 Member Data Documentation

6.19.2.1 `_0`

`age.event.Key._0`

6.19.2.2 `_1`

`age.event.Key._1`

6.19.2.3 `_2`

`age.event.Key._2`

6.19.2.4 `_3`

`age.event.Key._3`

6.19.2.5 `_4`

`age.event.Key._4`

6.19.2.6 _5

`age.event.Key._5`

6.19.2.7 _6

`age.event.Key._6`

6.19.2.8 _7

`age.event.Key._7`

6.19.2.9 _8

`age.event.Key._8`

6.19.2.10 _9

`age.event.Key._9`

6.19.2.11 A

`age.event.Key.A`

6.19.2.12 ADD

`age.event.Key.ADD`

6.19.2.13 ALT

`age.event.Key.ALT`

6.19.2.14 B

`age.event.Key.B`

6.19.2.15 BACK_SPACE

`age.event.Key.BACK_SPACE`

6.19.2.16 C

```
age.event.Key.C
```

6.19.2.17 CAPS_LOCK

```
age.event.Key.CAPS_LOCK
```

6.19.2.18 CONTROL

```
age.event.Key.CONTROL
```

6.19.2.19 D

```
age.event.Key.D
```

6.19.2.20 DECIMAL

```
age.event.Key.DECIMAL
```

6.19.2.21 DELETE

```
age.event.Key.DELETE
```

6.19.2.22 DIVIDE

```
age.event.Key.DIVIDE
```

6.19.2.23 DOWN

```
age.event.Key.DOWN
```

6.19.2.24 E

```
age.event.Key.E
```

6.19.2.25 END

```
age.event.Key.END
```

6.19.2.26 ENTER

```
age.event.Key.ENTER
```

6.19.2.27 ESCAPE

```
age.event.Key.ESCAPE
```

6.19.2.28 F

```
age.event.Key.F
```

6.19.2.29 F1

```
age.event.Key.F1
```

6.19.2.30 F10

```
age.event.Key.F10
```

6.19.2.31 F11

```
age.event.Key.F11
```

6.19.2.32 F12

```
age.event.Key.F12
```

6.19.2.33 F2

```
age.event.Key.F2
```

6.19.2.34 F3

```
age.event.Key.F3
```

6.19.2.35 F4

```
age.event.Key.F4
```


6.19.2.36 F5

```
age.event.Key.F5
```

6.19.2.37 F6

```
age.event.Key.F6
```

6.19.2.38 F7

```
age.event.Key.F7
```

6.19.2.39 F8

```
age.event.Key.F8
```

6.19.2.40 F9

```
age.event.Key.F9
```

6.19.2.41 G

```
age.event.Key.G
```

6.19.2.42 H

```
age.event.Key.H
```

6.19.2.43 I

```
age.event.Key.I
```

6.19.2.44 INSERT

```
age.event.Key.INSERT
```

6.19.2.45 J

```
age.event.Key.J
```

6.19.2.46 K

`age.event.Key.K`

6.19.2.47 L

`age.event.Key.L`

6.19.2.48 LEFT

`age.event.Key.LEFT`

6.19.2.49 M

`age.event.Key.M`

6.19.2.50 MENU

`age.event.Key.MENU`

6.19.2.51 MINUS

`age.event.Key.MINUS`

6.19.2.52 MULTIPLY

`age.event.Key.MULTIPLY`

6.19.2.53 N

`age.event.Key.N`

6.19.2.54 NONE

`age.event.Key.NONE`

Literal representing "No Key".

6.19.2.55 NP_0

`age.event.Key.NP_0`

6.19.2.56 NP_1`age.event.Key.NP_1`**6.19.2.57 NP_2**`age.event.Key.NP_2`**6.19.2.58 NP_3**`age.event.Key.NP_3`**6.19.2.59 NP_4**`age.event.Key.NP_4`**6.19.2.60 NP_5**`age.event.Key.NP_5`**6.19.2.61 NP_6**`age.event.Key.NP_6`**6.19.2.62 NP_7**`age.event.Key.NP_7`**6.19.2.63 NP_8**`age.event.Key.NP_8`**6.19.2.64 NP_9**`age.event.Key.NP_9`**6.19.2.65 NUM_LOCK**`age.event.Key.NUM_LOCK`

6.19.2.66 O

`age.event.Key.O`

6.19.2.67 P

`age.event.Key.P`

6.19.2.68 PAGE_DOWN

`age.event.Key.PAGE_DOWN`

6.19.2.69 PAGE_UP

`age.event.Key.PAGE_UP`

6.19.2.70 PAUSE

`age.event.Key.PAUSE`

6.19.2.71 PLUS

`age.event.Key.PLUS`

6.19.2.72 POS1

`age.event.Key.POS1`

6.19.2.73 PRINT_SCREEN

`age.event.Key.PRINT_SCREEN`

6.19.2.74 Q

`age.event.Key.Q`

6.19.2.75 R

`age.event.Key.R`

6.19.2.76 RIGHT

```
age.event.Key.RIGHT
```

6.19.2.77 S

```
age.event.Key.S
```

6.19.2.78 SCROLL_LOCK

```
age.event.Key.SCROLL_LOCK
```

6.19.2.79 SHIFT

```
age.event.Key.SHIFT
```

6.19.2.80 SPACE

```
age.event.Key.SPACE
```

6.19.2.81 SUBTRACT

```
age.event.Key.SUBTRACT
```

6.19.2.82 SYSTEM

```
age.event.Key.SYSTEM
```

6.19.2.83 T

```
age.event.Key.T
```

6.19.2.84 TAB

```
age.event.Key.TAB
```

6.19.2.85 U

```
age.event.Key.U
```

6.19.2.86 UP

`age.event.Key.UP`

6.19.2.87 V

`age.event.Key.V`

6.19.2.88 W

`age.event.Key.W`

6.19.2.89 X

`age.event.Key.X`

6.19.2.90 Y

`age.event.Key.Y`

6.19.2.91 Z

`age.event.Key.Z`

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

- [D:/GIT/repos/ODE/age/age/event/Key.java](#)

6.20 age.log.Level Enum Reference

Enumeration of Log Levels one can choose from that can be enabled/disabled separately.

Public Attributes

- **ERROR**
Error level literal.
- **WARNING**
Warning level literal.
- **INFO**
Info level literal.
- **DEBUG**
Debug level literal.

6.20.1 Detailed Description

Enumeration of Log Levels one can choose from that can be enabled/disabled separately.

6.20.2 Member Data Documentation

6.20.2.1 DEBUG

```
age.log.Level.DEBUG
```

Debug level literal.

6.20.2.2 ERROR

```
age.log.Level.ERROR
```

Error level literal.

6.20.2.3 INFO

```
age.log.Level.INFO
```

Info level literal.

6.20.2.4 WARNING

```
age.log.Level.WARNING
```

Warning level literal.

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

- D:/GIT/repos/ODE/age/age/log/[Level.java](#)

6.21 age.log.Log Class Reference

Class that provides configurable Logging capabilities.

Public Member Functions

- void `clear` ()
method to clear all set log levels
- void `enable` (Level ... levels)
method to enable all log levels passed in
- void `disable` (Level ... levels)
method to disable all log levels passed in
- boolean `trace` ()
property method to return the current state of the trace flag
- void `trace` (boolean trace)
property method to set the current state of the trace flag
- String `format` ()
property method to return the current format String for log entries
- void `format` (String format)
property method to set the current format String for log entries

Static Public Member Functions

- static void `configure` (String path)
This method reads a configuration file to preconfigure the logging system.
- static `Log` `get` (String instance)
This method returns a named log instance and creates one if not existing already.
- static void `log` (Level level, String message, Object ... params)
This method allows to write a log message for the "default" Log instance.
- static void `info` (String message, Object ... params)
This method allows to write an info message for the "default" Log instance.
- static void `warn` (String message, Object ... params)
This method allows to write a warning message for the "default" Log instance.
- static void `error` (String message, Object ... params)
This method allows to write an error message for the "default" Log instance.
- static void `debug` (String message, Object ... params)
This method allows to write a debug message for the "default" Log instance.
- static void `log` (String instance, Level level, String message, Object ... params)
This method allows to write a log message for a named Log instance.
- static void `info` (String instance, String message, Object ... params)
This method allows to write an info message for a named Log instance.
- static void `warn` (String instance, String message, Object ... params)
This method allows to write a warning message for a named Log instance.
- static void `error` (String instance, String message, Object ... params)
This method allows to write an error message for a named Log instance.
- static void `debug` (String instance, String message, Object ... params)
This method allows to write a debug message for a named Log instance.

Private Member Functions

- `Log` ()
Constructor that sets all configurable Log settings to default.
- `Log` (Log parent)
Class internal private copy constructor.
- void `write` (Level level, String message, Object ... params)
internal method to write a log message considering all configuration settings

Private Attributes

- boolean `trace` = false
flag if stack trace output is enabled or not for this Log instance
- Set< `Level` > `levels` = null
a set of Level literals that are enabled to print out log messages
- String `format` = null
the overall log entry format String

Static Private Attributes

- static final Map< String, `Log` > `map` = new HashMap<>()
Map that contains named log instances that can be configured independently.

6.21.1 Detailed Description

Class that provides configurable Logging capabilities.

6.21.2 Constructor & Destructor Documentation

6.21.2.1 `Log()` [1/2]

```
age.log.Log.Log ( ) [private]
```

Constructor that sets all configurable Log settings to default.

6.21.2.2 `Log()` [2/2]

```
age.log.Log.Log (
    Log parent ) [private]
```

Class internal private copy constructor.

Parameters

<i>parent</i>	the parent Log from which the settings will be copied
---------------	---

6.21.3 Member Function Documentation

6.21.3.1 `clear()`

```
void age.log.Log.clear ( )
```

method to clear all set log levels

6.21.3.2 configure()

```
static void age.log.Log.configure (
    String path ) [static]
```

This method reads a configuration file to preconfigure the logging system.

Parameters

<i>path</i>	The file path to the configuration file
-------------	---

6.21.3.3 debug() [1/2]

```
static void age.log.Log.debug (
    String instance,
    String message,
    Object ... params ) [static]
```

This method allows to write a debug message for a named Log instance.

Parameters

<i>instance</i>	the name of the log instance
<i>message</i>	the log message which may contain String formats
<i>params</i>	the format parameters for the message String

6.21.3.4 debug() [2/2]

```
static void age.log.Log.debug (
    String message,
    Object ... params ) [static]
```

This method allows to write a debug message for the "default" Log instance.

Parameters

<i>message</i>	the log message which may contain String formats
<i>params</i>	the format parameters for the message String

6.21.3.5 disable()

```
void age.log.Log.disable (
    Level ... levels )
```

method to disable all log levels passed in

Parameters

<i>levels</i>	the log levels passed in
---------------	--------------------------

6.21.3.6 enable()

```
void age.log.Log.enable (
    Level ... levels )
```

method to enable all log levels passed in

Parameters

<i>levels</i>	the log levels passed in
---------------	--------------------------

6.21.3.7 error() [1/2]

```
static void age.log.Log.error (
    String instance,
    String message,
    Object ... params ) [static]
```

This method allows to write an error message for a named Log instance.

Parameters

<i>instance</i>	the name of the log instance
<i>message</i>	the log message which may contain String formats
<i>params</i>	the format parameters for the message String

6.21.3.8 error() [2/2]

```
static void age.log.Log.error (
    String message,
    Object ... params ) [static]
```

This method allows to write an error message for the "default" Log instance.

Parameters

<i>message</i>	the log message which may contain String formats
<i>params</i>	the format parameters for the message String

6.21.3.9 format() [1/2]

```
String age.log.Log.format ( )
```

property method to return the current format String for log entries

Returns

the current format String

6.21.3.10 format() [2/2]

```
void age.log.Log.format (  
    String format )
```

property method to set the current format String for log entries

Parameters

<i>format</i>	the future format String
---------------	--------------------------

6.21.3.11 get()

```
static Log age.log.Log.get (  
    String instance ) [static]
```

This method returns a named log instance and creates one if not existing already.

Parameters

<i>instance</i>	the name of the log instance to return/create. a null String returns an instance named "default"
-----------------	--

Returns

The Log instance

6.21.3.12 info() [1/2]

```
static void age.log.Log.info (  
    String instance,  
    String message,  
    Object ... params ) [static]
```

This method allows to write an info message for a named Log instance.

Parameters

<i>instance</i>	the name of the log instance
<i>message</i>	the log message which may contain String formats
<i>params</i>	the format parameters for the message String

6.21.3.13 info() [2/2]

```
static void age.log.Log.info (
    String message,
    Object ... params ) [static]
```

This method allows to write an info message for the "default" Log instance.

Parameters

<i>message</i>	the log message which may contain String formats
<i>params</i>	the format parameters for the message String

6.21.3.14 log() [1/2]

```
static void age.log.Log.log (
    Level level,
    String message,
    Object ... params ) [static]
```

This method allows to write a log message for the "default" Log instance.

Parameters

<i>level</i>	the log level to log to
<i>message</i>	the log message which may contain String formats
<i>params</i>	the format parameters for the message String

6.21.3.15 log() [2/2]

```
static void age.log.Log.log (
    String instance,
    Level level,
    String message,
    Object ... params ) [static]
```

This method allows to write a log message for a named Log instance.

Parameters

<i>instance</i>	the name of the log instance
<i>level</i>	the log level to log to
<i>message</i>	the log message which may contain String formats
<i>params</i>	the format parameters for the message String

6.21.3.16 trace() [1/2]

```
boolean age.log.Log.trace ( )
```

property method to return the current state of the trace flag

Returns

the current state of the trace flag

6.21.3.17 trace() [2/2]

```
void age.log.Log.trace (
    boolean trace )
```

property method to set the current state of the trace flag

Parameters

<i>trace</i>	the state to set
--------------	------------------

6.21.3.18 warn() [1/2]

```
static void age.log.Log.warn (
    String instance,
    String message,
    Object ... params ) [static]
```

This method allows to write a warning message for a named Log instance.

Parameters

<i>instance</i>	the name of the log instance
<i>message</i>	the log message which may contain String formats
<i>params</i>	the format parameters for the message String

6.21.3.19 warn() [2/2]

```
static void age.log.Log.warn (
    String message,
    Object ... params ) [static]
```

This method allows to write a warning message for the "default" Log instance.

Parameters

<i>message</i>	the log message which may contain String formats
<i>params</i>	the format parameters for the message String

6.21.3.20 write()

```
void age.log.Log.write (
    Level level,
    String message,
    Object ... params ) [private]
```

internal method to write a log message considering all configuration settings

Parameters

<i>level</i>	the log level
<i>message</i>	the log message with possible format entries
<i>params</i>	the parameters for the formatted message String

6.21.4 Member Data Documentation

6.21.4.1 format

```
String age.log.Log.format = null [private]
```

the overall log entry format String

6.21.4.2 levels

```
Set<Level> age.log.Log.levels = null [private]
```

a set of Level literals that are enabled to print out log messages

6.21.4.3 map

```
final Map<String, Log> age.log.Log.map = new HashMap<>() [static], [private]
```

Map that contains named log instances that can be configured independently.

6.21.4.4 trace

```
boolean age.log.Log.trace = false [private]
```

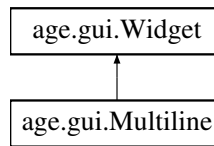
flag if stack trace output is enabled or not for this Log instance

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

- [D:/GIT/repos/ODE/age/age/log/Log.java](#)

6.22 age.gui.Multiline Class Reference

Inheritance diagram for age.gui.Multiline:



Public Member Functions

- [Multiline](#) ()
- void [assign](#) (Tasks tasks)
- void [text](#) (String text)
- int [offset](#) ()
- void [up](#) ()
- void [down](#) ()
- void [offset](#) (int offset)
- int [count](#) ()
- int [page](#) ()
- int [lineHeight](#) ()
- CharSequence [line](#) (int idx)
- int[] [buffer](#) ()
- void [rescale](#) (float dy)
- void [update](#) ()

Public Member Functions inherited from [age.gui.Widget](#)

- [Widget](#) (Flag ... flags)
- float [x](#) ()
- float [y](#) ()
- float [width](#) ()
- float [height](#) ()
- Vector2f [position](#) ()
- Vector2f [dimension](#) ()
- [Dock](#) [dock](#) ()
- void [dock](#) (Dock dock)
- void [dock](#) (float top, float bottom, float left, float right)
- void [position](#) (Vector2f position)
- void [position](#) (float x, float y)
- void [positionAdd](#) (Vector2f position)
- void [positionAdd](#) (float x, float y)
- void [dimension](#) (Vector2f dimension)
- void [dimension](#) (float width, float height)
- void [dimensionAdd](#) (Vector2f dimension)
- void [dimensionAdd](#) (float width, float height)
- Set< [Flag](#) > [flags](#) ()
- void [flag](#) (Flag ... flags)
- void [clear](#) (Flag ... flags)
- boolean [match](#) (Flag ... flags)
- [Widget](#) [parent](#) ()

- List< [Widget](#) > [children](#) ()
- void [add](#) ([Widget](#) child)
- void [add](#) (int idx, [Widget](#) child)
- void [remove](#) ()
- void [toFront](#) ()
- String [text](#) ()
- String [image](#) ()
- void [image](#) (String image)
- String [command](#) ()
- void [command](#) (String command)

Private Member Functions

- void [create](#) ()

Private Attributes

- int [offset](#)
- int[] [buffer](#) = new int[1024]
- [VScroller](#) [scroller](#)

6.22.1 Constructor & Destructor Documentation

6.22.1.1 Multiline()

```
age.gui.Multiline.Multiline ( )
```

6.22.2 Member Function Documentation

6.22.2.1 assign()

```
void age.gui.Multiline.assign (
    Tasks tasks )
```

6.22.2.2 buffer()

```
int[] age.gui.Multiline.buffer ( )
```

6.22.2.3 count()

```
int age.gui.Multiline.count ( )
```

6.22.2.4 create()

```
void age.gui.Multiline.create ( ) [private]
```

6.22.2.5 down()

```
void age.gui.Multiline.down ( )
```

6.22.2.6 line()

```
CharSequence age.gui.Multiline.line (
    int idx )
```

6.22.2.7 lineHeight()

```
int age.gui.Multiline.lineHeight ( )
```

6.22.2.8 offset() [1/2]

```
int age.gui.Multiline.offset ( )
```

6.22.2.9 offset() [2/2]

```
void age.gui.Multiline.offset (
    int offset )
```

6.22.2.10 page()

```
int age.gui.Multiline.page ( )
```

6.22.2.11 rescale()

```
void age.gui.Multiline.rescale (
    float dy )
```

6.22.2.12 text()

```
void age.gui.Multiline.text (
    String text )
```

Reimplemented from [age.gui.Widget](#).

6.22.2.13 up()

```
void age.gui.Multiline.up ( )
```

6.22.2.14 update()

```
void age.gui.Multiline.update ( )
```

6.22.3 Member Data Documentation

6.22.3.1 buffer

```
int [ ] age.gui.Multiline.buffer = new int[1024] [private]
```

6.22.3.2 offset

```
int age.gui.Multiline.offset [private]
```

6.22.3.3 scroller

```
VScroller age.gui.Multiline.scroller [private]
```

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

- [D:/GIT/repos/ODE/age/age/gui/Multiline.java](#)

6.23 age.scene.Node Class Reference

Public Member Functions

- [Node](#) [parent](#) ()
- List< [Node](#) > [children](#) ()
- void [attach](#) ([Node](#) node)
- void [attach](#) (int idx, [Node](#) node)
- void [detach](#) ()
- Set< [Flag](#) > [flags](#) ()
- void [flag](#) ([Flag](#) ... [flags](#))
- void [clear](#) ([Flag](#) ... [flags](#))
- boolean [match](#) ([Flag](#) ... [flags](#))
- Object [component](#) ([Part](#) part)
- void [component](#) ([Part](#) part, Object component)
- Map< [Part](#), Object > [components](#) ()

Package Functions

- public< C > C [component](#) ([Part](#) part, Class< C > cls)

Private Attributes

- [Node](#) `parent`
- final List< [Node](#) > `children` = new ArrayList<>(5)
- final List< [Node](#) > `children_ro` = Collections.unmodifiableList(`children`)
- Set< [Flag](#) > `flags` = EnumSet.noneOf([Flag](#).class)
- Set< [Flag](#) > `flags_ro` = Collections.unmodifiableSet(`flags`)
- final Map< [Part](#), Object > `components` = new EnumMap<>([Part](#).class)
- final Map< [Part](#), Object > `components_ro` = Collections.unmodifiableMap(`components`)

6.23.1 Member Function Documentation

6.23.1.1 `attach()` [1/2]

```
void age.scene.Node.attach (
    int idx,
    Node node )
```

6.23.1.2 `attach()` [2/2]

```
void age.scene.Node.attach (
    Node node )
```

6.23.1.3 `children()`

```
List< Node > age.scene.Node.children ( )
```

6.23.1.4 `clear()`

```
void age.scene.Node.clear (
    Flag ... flags )
```

6.23.1.5 `component()` [1/3]

```
Object age.scene.Node.component (
    Part part )
```

6.23.1.6 `component()` [2/3]

```
public< C > C age.scene.Node.component (
    Part part,
    Class< C > cls ) [package]
```

6.23.1.7 component() [3/3]

```
void age.scene.Node.component (
    Part part,
    Object component )
```

6.23.1.8 components()

```
Map< Part, Object > age.scene.Node.components ( )
```

6.23.1.9 detach()

```
void age.scene.Node.detach ( )
```

6.23.1.10 flag()

```
void age.scene.Node.flag (
    Flag ... flags )
```

6.23.1.11 flags()

```
Set< Flag > age.scene.Node.flags ( )
```

6.23.1.12 match()

```
boolean age.scene.Node.match (
    Flag ... flags )
```

6.23.1.13 parent()

```
Node age.scene.Node.parent ( )
```

6.23.2 Member Data Documentation

6.23.2.1 children

```
final List<Node> age.scene.Node.children = new ArrayList<>(5) [private]
```

6.23.2.2 children_ro

```
final List<Node> age.scene.Node.children_ro = Collections.unmodifiableList(children) [private]
```

6.23.2.3 components

```
final Map<Part, Object> age.scene.Node.components = new EnumMap<>(Part.class) [private]
```

6.23.2.4 components_ro

```
final Map<Part, Object> age.scene.Node.components_ro = Collections.unmodifiableMap(components)  
[private]
```

6.23.2.5 flags

```
Set<Flag> age.scene.Node.flags = EnumSet.noneOf(Flag.class) [private]
```

6.23.2.6 flags_ro

```
Set<Flag> age.scene.Node.flags_ro = Collections.unmodifiableSet(flags) [private]
```

6.23.2.7 parent

```
Node age.scene.Node.parent [private]
```

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

- D:/GIT/repos/ODE/age/age/scene/[Node.java](#)

6.24 age.scene.Part Enum Reference

Public Member Functions

- void [check](#) (Object object)

Public Attributes

- [TRANSFORM](#) =(Matrix4f.class)
- [CAMERA](#) =(Camera.class)

Private Member Functions

- [Part](#) (Class<?> [cls](#))

Private Attributes

- Class<?> [cls](#)

6.24.1 Constructor & Destructor Documentation

6.24.1.1 Part()

```
age.scene.Part.Part (
    Class<?> cls ) [private]
```

6.24.2 Member Function Documentation

6.24.2.1 check()

```
void age.scene.Part.check (
    Object object )
```

6.24.3 Member Data Documentation

6.24.3.1 CAMERA

```
age.scene.Part.CAMERA = (Camera.class)
```

6.24.3.2 cls

```
Class<?> age.scene.Part.cls [private]
```

6.24.3.3 TRANSFORM

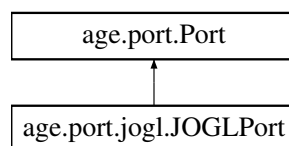
```
age.scene.Part.TRANSFORM = (Matrix4f.class)
```

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

- D:/GIT/repos/ODE/age/age/scene/[Part.java](#)

6.25 age.port.Port Interface Reference

Inheritance diagram for age.port.Port:



Public Member Functions

- void [assign](#) (Events events)
- String [title](#) ()
- void [title](#) (String title)
- boolean [maximized](#) ()
- void [maximized](#) (boolean maximized)
- boolean [fullscreen](#) ()
- void [fullscreen](#) (boolean fullscreen)
- boolean [visible](#) ()
- void [visible](#) (boolean visible)
- float [width](#) ()
- float [height](#) ()
- void [size](#) (float [width](#), float [height](#))
- void [add](#) ([Renderable](#) renderable)
- void [create](#) ()
- void [render](#) ()

6.25.1 Member Function Documentation

6.25.1.1 [add\(\)](#)

```
void age.port.Port.add (  
    Renderable renderable )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.2 [assign\(\)](#)

```
void age.port.Port.assign (  
    Events events )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.3 [create\(\)](#)

```
void age.port.Port.create ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.4 [fullscreen\(\)](#) [1/2]

```
boolean age.port.Port.fullscreen ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.5 fullscreen() [2/2]

```
void age.port.Port.fullscreen (
    boolean fullscreen )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.6 height()

```
float age.port.Port.height ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.7 maximized() [1/2]

```
boolean age.port.Port.maximized ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.8 maximized() [2/2]

```
void age.port.Port.maximized (
    boolean maximized )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.9 render()

```
void age.port.Port.render ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.10 size()

```
void age.port.Port.size (
    float width,
    float height )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.11 title() [1/2]

```
String age.port.Port.title ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.12 title() [2/2]

```
void age.port.Port.title (
    String title )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.13 visible() [1/2]

```
boolean age.port.Port.visible ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.14 visible() [2/2]

```
void age.port.Port.visible (
    boolean visible )
```

Implemented in [age.port.jogl.JOGLPort](#).

6.25.1.15 width()

```
float age.port.Port.width ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

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

- D:/GIT/repos/ODE/age/age/port/[Port.java](#)

6.26 age.port.Renderable Interface Reference

Public Member Functions

- void [render](#) ([Graphics](#) g)

6.26.1 Member Function Documentation

6.26.1.1 render()

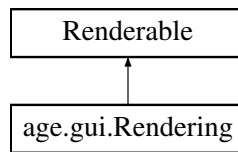
```
void age.port.Renderable.render (
    Graphics g )
```

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

- D:/GIT/repos/ODE/age/age/port/[Renderable.java](#)

6.27 age.gui.Rendering Class Reference

Inheritance diagram for age.gui.Rendering:



Public Member Functions

- [Rendering](#) ([Widgets](#) widgets)
- void [render](#) ([Graphics](#) g)

Private Member Functions

- void [render](#) ([Graphics](#) g, [Widget](#) widget)
- void [renderWidget](#) ([Graphics](#) g, [Widget](#) widget)
- boolean [renderBox](#) ([Graphics](#) g, [Widget](#) widget)
- boolean [renderFrame](#) ([Graphics](#) g, [Widget](#) widget)
- boolean [renderButton](#) ([Graphics](#) g, [Widget](#) widget)
- boolean [renderCanvas](#) ([Graphics](#) g, [Widget](#) widget)
- boolean [renderTitle](#) ([Graphics](#) g, [Widget](#) widget)
- boolean [renderHandle](#) ([Graphics](#) g, [Widget](#) widget)
- boolean [renderMultiline](#) ([Graphics](#) g, [Widget](#) widget)
- void [renderChildren](#) ([Graphics](#) g, List< [Widget](#) > children)

Private Attributes

- final [Widgets](#) widgets

6.27.1 Constructor & Destructor Documentation

6.27.1.1 Rendering()

```
age.gui.Rendering.Rendering (
    Widgets widgets )
```

6.27.2 Member Function Documentation

6.27.2.1 render() [1/2]

```
void age.gui.Rendering.render (
    Graphics g )
```

6.27.2.2 render() [2/2]

```
void age.gui.Rendering.render (
    Graphics g,
    Widget widget ) [private]
```

6.27.2.3 renderBox()

```
boolean age.gui.Rendering.renderBox (
    Graphics g,
    Widget widget ) [private]
```

6.27.2.4 renderButton()

```
boolean age.gui.Rendering.renderButton (
    Graphics g,
    Widget widget ) [private]
```

6.27.2.5 renderCanvas()

```
boolean age.gui.Rendering.renderCanvas (
    Graphics g,
    Widget widget ) [private]
```

6.27.2.6 renderChildren()

```
void age.gui.Rendering.renderChildren (
    Graphics g,
    List< Widget > children ) [private]
```

6.27.2.7 renderFrame()

```
boolean age.gui.Rendering.renderFrame (
    Graphics g,
    Widget widget ) [private]
```

6.27.2.8 renderHandle()

```
boolean age.gui.Rendering.renderHandle (
    Graphics g,
    Widget widget ) [private]
```

6.27.2.9 renderMultiline()

```
boolean age.gui.Rendering.renderMultiline (
    Graphics g,
    Widget widget ) [private]
```

6.27.2.10 renderTitle()

```
boolean age.gui.Rendering.renderTitle (
    Graphics g,
    Widget widget ) [private]
```

6.27.2.11 renderWidget()

```
void age.gui.Rendering.renderWidget (
    Graphics g,
    Widget widget ) [private]
```

6.27.3 Member Data Documentation

6.27.3.1 widgets

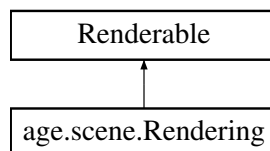
```
final Widgets age.gui.Rendering.widgets [private]
```

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

- [D:/GIT/repos/ODE/age/age/gui/Rendering.java](#)

6.28 age.scene.Rendering Class Reference

Inheritance diagram for age.scene.Rendering:



Public Member Functions

- [Rendering](#) ([Scene scene](#))
- void [render](#) ([Graphics g](#))

Private Member Functions

- void [renderCamera](#) ([Graphics g](#), [Node node](#))
- void [render](#) ([Graphics g](#), [Node node](#))
- void [renderNode](#) ([Graphics g](#), [Node node](#))

Private Attributes

- final [Scene scene](#)

6.28.1 Constructor & Destructor Documentation

6.28.1.1 Rendering()

```
age.scene.Rendering.Rendering (
    Scene scene )
```

6.28.2 Member Function Documentation

6.28.2.1 render() [1/2]

```
void age.scene.Rendering.render (
    Graphics g )
```

6.28.2.2 render() [2/2]

```
void age.scene.Rendering.render (
    Graphics g,
    Node node ) [private]
```

6.28.2.3 renderCamera()

```
void age.scene.Rendering.renderCamera (
    Graphics g,
    Node node ) [private]
```

6.28.2.4 renderNode()

```
void age.scene.Rendering.renderNode (
    Graphics g,
    Node node ) [private]
```

6.28.3 Member Data Documentation

6.28.3.1 scene

```
final Scene age.scene.Rendering.scene [private]
```

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

- D:/GIT/repos/ODE/age/age/scene/[Rendering.java](#)

6.29 age.scene.Scene Class Reference

Public Member Functions

- void [assign](#) (Port port)
- [Node](#) [root](#) ()
- [Node](#) [camera](#) ()
- void [camera](#) ([Node](#) camera)

Private Attributes

- [Node](#) [root](#) = new [Node](#)()
- [Node](#) [camera](#) = null
- [Rendering](#) [rendering](#) = new [Rendering](#)(this)

6.29.1 Member Function Documentation

6.29.1.1 assign()

```
void age.scene.Scene.assign (  
    Port port )
```

6.29.1.2 camera() [1/2]

```
Node age.scene.Scene.camera ( )
```

6.29.1.3 camera() [2/2]

```
void age.scene.Scene.camera (  
    Node camera )
```

6.29.1.4 root()

```
Node age.scene.Scene.root ( )
```

6.29.2 Member Data Documentation

6.29.2.1 camera

```
Node age.scene.Scene.camera = null [private]
```

6.29.2.2 rendering

```
Rendering age.scene.Scene.rendering = new Rendering(this) [private]
```

6.29.2.3 root

```
Node age.scene.Scene.root = new Node() [private]
```

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

- D:/GIT/repos/ODE/age/age/scene/[Scene.java](#)

6.30 age.clock.Task Interface Reference

The Task interface that defines the call parameters for a Task reference method

Public Member Functions

- void [run](#) (int count, long nanoperiod, float dT)
The definition of the Task reference method.

6.30.1 Detailed Description

The Task interface that defines the call parameters for a Task reference method

6.30.2 Member Function Documentation

6.30.2.1 run()

```
void age.clock.Task.run (
    int count,
    long nanoperiod,
    float dT )
```

The definition of the Task reference method.

Parameters

<i>count</i>	number of full nanoperiods that have elapsed since last call. Normally 1
<i>nanoperiod</i>	the time period in nano seconds after which the Task normally is triggered
<i>dT</i>	the time in seconds that did elapse since last call.

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

- D:/GIT/repos/ODE/age/age/clock/[Task.java](#)

6.31 age.task.Task Interface Reference

Public Member Functions

- void [perform](#) ()

6.31.1 Member Function Documentation

6.31.1.1 [perform\(\)](#)

```
void age.task.Task.perform ( )
```

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

- D:/GIT/repos/ODE/age/age/task/[Task.java](#)

6.32 age.task.Tasks Class Reference

Public Member Functions

- void [assign](#) (Port [port](#))
- void [assign](#) (Client [client](#))
- void [assign](#) (Events [events](#))
- [Tasks](#) ()
- void [put](#) (String command)
- void [assign](#) (String command, [Task](#) task)
- void [update](#) ()

Private Member Functions

- void [handleEvent](#) (Event e)
- void [construct](#) ()
- void [perform](#) (String command)
- void [toggleFullscreen](#) ()
- void [shutdown](#) ()

Private Attributes

- final List< String > [inbox](#) = new ArrayList<>()
- final List< String > [outbox](#) = new ArrayList<>()
- final Map< String, [Task](#) > [tasks](#) = new HashMap<>()
- Port [port](#)
- Client [client](#)

6.32.1 Constructor & Destructor Documentation

6.32.1.1 Tasks()

```
age.task.Tasks.Tasks ( )
```

6.32.2 Member Function Documentation

6.32.2.1 assign() [1/4]

```
void age.task.Tasks.assign (
    Client client )
```

6.32.2.2 assign() [2/4]

```
void age.task.Tasks.assign (
    Events events )
```

6.32.2.3 assign() [3/4]

```
void age.task.Tasks.assign (
    Port port )
```

6.32.2.4 assign() [4/4]

```
void age.task.Tasks.assign (
    String command,
    Task task )
```

6.32.2.5 construct()

```
void age.task.Tasks.construct ( ) [private]
```

6.32.2.6 handleEvent()

```
void age.task.Tasks.handleEvent (
    Event e ) [private]
```

6.32.2.7 perform()

```
void age.task.Tasks.perform (
    String command ) [private]
```

6.32.2.8 put()

```
void age.task.Tasks.put (
    String command )
```

6.32.2.9 shutdown()

```
void age.task.Tasks.shutdown ( ) [private]
```

6.32.2.10 toggleFullscreen()

```
void age.task.Tasks.toggleFullscreen ( ) [private]
```

6.32.2.11 update()

```
void age.task.Tasks.update ( )
```

6.32.3 Member Data Documentation

6.32.3.1 client

```
Client age.task.Tasks.client [private]
```

6.32.3.2 inbox

```
final List<String> age.task.Tasks.inbox = new ArrayList<>() [private]
```

6.32.3.3 outbox

```
final List<String> age.task.Tasks.outbox = new ArrayList<>() [private]
```

6.32.3.4 port

```
Port age.task.Tasks.port [private]
```

6.32.3.5 tasks

```
final Map<String, Task> age.task.Tasks.tasks = new HashMap<>() [private]
```

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

- [D:/GIT/repos/ODE/age/age/task/Tasks.java](#)

6.33 TODO Class Reference

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

- [D:/GIT/repos/ODE/age/TODO.java](#)

6.34 age.event.Type Enum Reference

Enumeration of Event Types to register to.

Public Attributes

- [NONE](#)
Literal representing "No Event".
- [KEY_PRESSED](#)
- [KEY_RELEASED](#)
- [KEY_TYPED](#)
- [POINTER_ENTERED](#)
- [POINTER_EXITED](#)
- [POINTER_PRESSED](#)
- [POINTER_RELEASED](#)
- [POINTER_CLICKED](#)
- [POINTER_MOVED](#)
- [SURFACE_RESIZED](#)
- [SURFACE_CLOSE_REQUEST](#)
- [TASK_COMMAND](#)

6.34.1 Detailed Description

Enumeration of Event Types to register to.

6.34.2 Member Data Documentation

6.34.2.1 KEY_PRESSED

```
age.event.Type.KEY_PRESSED
```

6.34.2.2 KEY_RELEASED

```
age.event.Type.KEY_RELEASED
```

6.34.2.3 KEY_TYPED

```
age.event.Type.KEY_TYPED
```

6.34.2.4 NONE

```
age.event.Type.NONE
```

Literal representing "No Event".

6.34.2.5 POINTER_CLICKED

```
age.event.Type.POINTER_CLICKED
```

6.34.2.6 POINTER_ENTERED

```
age.event.Type.POINTER_ENTERED
```

6.34.2.7 POINTER_EXITED

```
age.event.Type.POINTER_EXITED
```

6.34.2.8 POINTER_MOVED

```
age.event.Type.POINTER_MOVED
```

6.34.2.9 POINTER_PRESSED

```
age.event.Type.POINTER_PRESSED
```

6.34.2.10 POINTER_RELEASED

```
age.event.Type.POINTER_RELEASED
```

6.34.2.11 SURFACE_CLOSE_REQUEST

```
age.event.Type.SURFACE_CLOSE_REQUEST
```

6.34.2.12 SURFACE_RESIZED

```
age.event.Type.SURFACE_RESIZED
```

6.34.2.13 TASK_COMMAND

`age.event.Type.TASK_COMMAND`

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

- [D:/GIT/repos/ODE/age/age/event/Type.java](#)

6.35 age.Util Class Reference

The AGE Utility class.

Static Public Member Functions

- static final String [readTextFile](#) (String path)
Static utility method to load and return text read from a file located by path.
- static final< C > C [readJsonFile](#) (String path, Class< C > cls)
Utility method to read JSON files.
- static float[] [toGLMatrix](#) (Matrix4f m, float[] buffer)
Utility method to transform a vecmath matrix into an Open GL matrix array.
- static Matrix4f [fromGLMatrix](#) (Matrix4f m, float[] buffer)
Utility method to transform an Open GL matrix array into a vecmath matrix.
- static Matrix4f [camReverse](#) (Matrix4f src, Matrix4f dst)
Utility method to convert a world transformation matrix into an inverted camera centric matrix.

Static Private Attributes

- static final ObjectMapper [objectMapper](#) = new ObjectMapper()
Internally used JSON mapper.

6.35.1 Detailed Description

The AGE Utility class.

6.35.2 Member Function Documentation

6.35.2.1 camReverse()

```
static Matrix4f age.Util.camReverse (  
    Matrix4f src,  
    Matrix4f dst ) [static]
```

Utility method to convert a world transformation matrix into an inverted camera centric matrix.

Parameters

<i>src</i>	the world transformation matrix of the camera
<i>dst</i>	the inverted transformation matrix to transform world transformations into camera relative transformations

Returns

the filled in transformation matrix

6.35.2.2 fromGLMatrix()

```
static Matrix4f age.Util.fromGLMatrix (
    Matrix4f m,
    float[] buffer ) [static]
```

Utility method to transform an Open GL matrix array into a vecmath matrix.

Parameters

<i>m</i>	the target vecmath matrix
<i>buffer</i>	the source Open GL matrix array

Returns

the filled target vecmath matrix

6.35.2.3 readJsonFile()

```
static final< C > C age.Util.readJsonFile (
    String path,
    Class< C > cls ) [static]
```

Utility method to read JSON files.

Parameters

<i>path</i>	The file path of the JSON file
<i>cls</i>	the Class type the JSON file will be transformed to

Returns

the typed object the JSON file is transformed to

6.35.2.4 readTextFile()

```
static final String age.Util.readTextFile (
    String path ) [static]
```

Static utility method to load and return text read from a file located by path.

Parameters

<i>path</i>	The file path String of the file to be read
-------------	---

Returns

The file contents as a text String

6.35.2.5 toGLMatrix()

```
static float[] age.Util.toGLMatrix (
    Matrix4f m,
    float[] buffer ) [static]
```

Utility method to transform a vecmath matrix into an Open GL matrix array.

Parameters

<i>m</i>	the vecmath source matrix
<i>buffer</i>	the Open GL matrix target buffer

Returns

the filled Open GL matrix target buffer

6.35.3 Member Data Documentation

6.35.3.1 objectMapper

```
final ObjectMapper age.Util.objectMapper = new ObjectMapper() [static], [private]
```

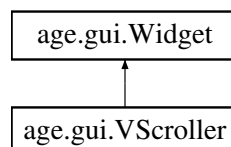
Internally used JSON mapper.

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

- D:/GIT/repos/ODE/age/age/[Util.java](#)

6.36 age.gui.VScroller Class Reference

Inheritance diagram for age.gui.VScroller:



Public Member Functions

- [VScroller](#) ()
- void [assign](#) (Tasks tasks, Task taskUp, Task taskDn)
- void [set](#) (int [size](#), int [page](#), int [mark](#))
- void [value](#) (int [mark](#))
- [Widget](#) [handle](#) ()

Public Member Functions inherited from [age.gui.Widget](#)

- [Widget](#) (Flag ... [flags](#))
- float [x](#) ()
- float [y](#) ()
- float [width](#) ()
- float [height](#) ()
- Vector2f [position](#) ()
- Vector2f [dimension](#) ()
- [Dock](#) [dock](#) ()
- void [dock](#) ([Dock](#) dock)
- void [dock](#) (float top, float bottom, float left, float right)
- void [position](#) (Vector2f position)
- void [position](#) (float [x](#), float [y](#))
- void [positionAdd](#) (Vector2f [position](#))
- void [positionAdd](#) (float [x](#), float [y](#))
- void [dimension](#) (Vector2f dimension)
- void [dimension](#) (float [width](#), float [height](#))
- void [dimensionAdd](#) (Vector2f [dimension](#))
- void [dimensionAdd](#) (float [width](#), float [height](#))
- Set< [Flag](#) > [flags](#) ()
- void [flag](#) (Flag ... [flags](#))
- void [clear](#) (Flag ... [flags](#))
- boolean [match](#) (Flag ... [flags](#))
- [Widget](#) [parent](#) ()
- List< [Widget](#) > [children](#) ()
- void [add](#) ([Widget](#) child)
- void [add](#) (int idx, [Widget](#) child)
- void [remove](#) ()
- void [toFront](#) ()
- String [text](#) ()
- void [text](#) (String text)
- String [image](#) ()
- void [image](#) (String image)
- String [command](#) ()
- void [command](#) (String command)

Private Member Functions

- void [create](#) ()

Private Attributes

- [Widget btnUp](#)
- [Widget bar](#)
- [Widget handle](#)
- [Widget btnDn](#)
- UUID [uuid](#) = UUID.randomUUID()
- int [size](#)
- int [page](#)
- int [mark](#)

6.36.1 Constructor & Destructor Documentation

6.36.1.1 VScroller()

```
age.gui.VScroller.VScroller ( )
```

6.36.2 Member Function Documentation

6.36.2.1 assign()

```
void age.gui.VScroller.assign (
    Tasks tasks,
    Task taskUp,
    Task taskDn )
```

6.36.2.2 create()

```
void age.gui.VScroller.create ( ) [private]
```

6.36.2.3 handle()

```
Widget age.gui.VScroller.handle ( )
```

6.36.2.4 set()

```
void age.gui.VScroller.set (
    int size,
    int page,
    int mark )
```

6.36.2.5 value()

```
void age.gui.VScroller.value (
    int mark )
```

6.36.3 Member Data Documentation

6.36.3.1 bar

`Widget age.gui.VScroller.bar [private]`

6.36.3.2 btnDn

`Widget age.gui.VScroller.btnDn [private]`

6.36.3.3 btnUp

`Widget age.gui.VScroller.btnUp [private]`

6.36.3.4 handle

`Widget age.gui.VScroller.handle [private]`

6.36.3.5 mark

`int age.gui.VScroller.mark [private]`

6.36.3.6 page

`int age.gui.VScroller.page [private]`

6.36.3.7 size

`int age.gui.VScroller.size [private]`

6.36.3.8 uuid

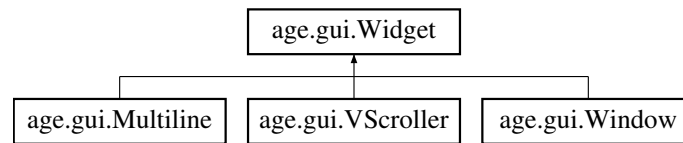
`UUID age.gui.VScroller.uuid = UUID.randomUUID() [private]`

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

- [D:/GIT/repos/ODE/age/age/gui/VScroller.java](#)

6.37 age.gui.Widget Class Reference

Inheritance diagram for age.gui.Widget:



Public Member Functions

- [Widget](#) ([Flag](#) ... [flags](#))
- float [x](#) ()
- float [y](#) ()
- float [width](#) ()
- float [height](#) ()
- Vector2f [position](#) ()
- Vector2f [dimension](#) ()
- [Dock](#) [dock](#) ()
- void [dock](#) ([Dock](#) [dock](#))
- void [dock](#) (float top, float bottom, float left, float right)
- void [position](#) (Vector2f [position](#))
- void [position](#) (float [x](#), float [y](#))
- void [positionAdd](#) (Vector2f [position](#))
- void [positionAdd](#) (float [x](#), float [y](#))
- void [dimension](#) (Vector2f [dimension](#))
- void [dimension](#) (float [width](#), float [height](#))
- void [dimensionAdd](#) (Vector2f [dimension](#))
- void [dimensionAdd](#) (float [width](#), float [height](#))
- Set< [Flag](#) > [flags](#) ()
- void [flag](#) ([Flag](#) ... [flags](#))
- void [clear](#) ([Flag](#) ... [flags](#))
- boolean [match](#) ([Flag](#) ... [flags](#))
- [Widget](#) [parent](#) ()
- List< [Widget](#) > [children](#) ()
- void [add](#) ([Widget](#) child)
- void [add](#) (int idx, [Widget](#) child)
- void [remove](#) ()
- void [toFront](#) ()
- String [text](#) ()
- void [text](#) (String text)
- String [image](#) ()
- void [image](#) (String image)
- String [command](#) ()
- void [command](#) (String command)

Private Member Functions

- void [resized](#) (float dx, float dy)
- void [parentResized](#) (float dx, float dy)

Private Attributes

- final Set< [Flag](#) > [flags](#) = EnumSet.noneOf(Flag.class)
- final Set< [Flag](#) > [flags_ro](#) = Collections.unmodifiableSet([flags](#))
- final Vector2f [position](#) = new Vector2f()
- final Vector2f [dimension](#) = new Vector2f()
- final [Dock](#) [dock](#) = new [Dock](#)()
- [Widget](#) [parent](#) = null
- final List< [Widget](#) > [children](#) = new ArrayList<>(10)
- final List< [Widget](#) > [children_ro](#) = Collections.unmodifiableList([children](#))
- String [text](#) = null
- String [image](#) = null
- String [command](#) = null

6.37.1 Constructor & Destructor Documentation

6.37.1.1 Widget()

```
age.gui.Widget.Widget (
    Flag ... flags )
```

6.37.2 Member Function Documentation

6.37.2.1 add() [1/2]

```
void age.gui.Widget.add (
    int idx,
    Widget child )
```

6.37.2.2 add() [2/2]

```
void age.gui.Widget.add (
    Widget child )
```

6.37.2.3 children()

```
List< Widget > age.gui.Widget.children ( )
```

6.37.2.4 clear()

```
void age.gui.Widget.clear (
    Flag ... flags )
```

6.37.2.5 command() [1/2]

```
String age.gui.Widget.command ( )
```

6.37.2.6 command() [2/2]

```
void age.gui.Widget.command (
    String command )
```

6.37.2.7 dimension() [1/3]

```
Vector2f age.gui.Widget.dimension ( )
```

6.37.2.8 dimension() [2/3]

```
void age.gui.Widget.dimension (
    float width,
    float height )
```

6.37.2.9 dimension() [3/3]

```
void age.gui.Widget.dimension (
    Vector2f dimension )
```

6.37.2.10 dimensionAdd() [1/2]

```
void age.gui.Widget.dimensionAdd (
    float width,
    float height )
```

6.37.2.11 dimensionAdd() [2/2]

```
void age.gui.Widget.dimensionAdd (
    Vector2f dimension )
```

6.37.2.12 dock() [1/3]

```
Dock age.gui.Widget.dock ( )
```

6.37.2.13 dock() [2/3]

```
void age.gui.Widget.dock (
    Dock dock )
```

6.37.2.14 dock() [3/3]

```
void age.gui.Widget.dock (
    float top,
    float bottom,
    float left,
    float right )
```

6.37.2.15 flag()

```
void age.gui.Widget.flag (
    Flag ... flags )
```

6.37.2.16 flags()

```
Set< Flag > age.gui.Widget.flags ( )
```

6.37.2.17 height()

```
float age.gui.Widget.height ( )
```

6.37.2.18 image() [1/2]

```
String age.gui.Widget.image ( )
```

6.37.2.19 image() [2/2]

```
void age.gui.Widget.image (
    String image )
```

6.37.2.20 match()

```
boolean age.gui.Widget.match (
    Flag ... flags )
```

6.37.2.21 parent()

```
Widget age.gui.Widget.parent ( )
```

6.37.2.22 parentResized()

```
void age.gui.Widget.parentResized (
    float dx,
    float dy ) [private]
```


6.37.2.23 position() [1/3]

```
Vector2f age.gui.Widget.position ( )
```

6.37.2.24 position() [2/3]

```
void age.gui.Widget.position (
    float x,
    float y )
```

6.37.2.25 position() [3/3]

```
void age.gui.Widget.position (
    Vector2f position )
```

6.37.2.26 positionAdd() [1/2]

```
void age.gui.Widget.positionAdd (
    float x,
    float y )
```

6.37.2.27 positionAdd() [2/2]

```
void age.gui.Widget.positionAdd (
    Vector2f position )
```

6.37.2.28 remove()

```
void age.gui.Widget.remove ( )
```

6.37.2.29 resized()

```
void age.gui.Widget.resized (
    float dx,
    float dy ) [private]
```

6.37.2.30 text() [1/2]

```
String age.gui.Widget.text ( )
```

6.37.2.31 text() [2/2]

```
void age.gui.Widget.text (
    String text )
```

Reimplemented in [age.gui.Multiline](#).

6.37.2.32 toFront()

```
void age.gui.Widget.toFront ( )
```

6.37.2.33 width()

```
float age.gui.Widget.width ( )
```

6.37.2.34 x()

```
float age.gui.Widget.x ( )
```

6.37.2.35 y()

```
float age.gui.Widget.y ( )
```

6.37.3 Member Data Documentation

6.37.3.1 children

```
final List<Widget> age.gui.Widget.children = new ArrayList<>(10) [private]
```

6.37.3.2 children_ro

```
final List<Widget> age.gui.Widget.children_ro = Collections.unmodifiableList(children) [private]
```

6.37.3.3 command

```
String age.gui.Widget.command = null [private]
```

6.37.3.4 dimension

```
final Vector2f age.gui.Widget.dimension = new Vector2f() [private]
```

6.37.3.5 dock

```
final Dock age.gui.Widget.dock = new Dock() [private]
```

6.37.3.6 flags

```
final Set<Flag> age.gui.Widget.flags = EnumSet.noneOf(Flag.class) [private]
```

6.37.3.7 flags_ro

```
final Set<Flag> age.gui.Widget.flags_ro = Collections.unmodifiableSet(flags) [private]
```

6.37.3.8 image

```
String age.gui.Widget.image = null [private]
```

6.37.3.9 parent

```
Widget age.gui.Widget.parent = null [private]
```

6.37.3.10 position

```
final Vector2f age.gui.Widget.position = new Vector2f() [private]
```

6.37.3.11 text

```
String age.gui.Widget.text = null [private]
```

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

- [D:/GIT/repos/ODE/age/age/gui/Widget.java](#)

6.38 age.gui.Widgets Class Reference

Public Member Functions

- [Widgets](#) ()
- void [assign](#) (Port port)
- void [assign](#) (Events events)
- [Widget root](#) ()

Private Attributes

- [Widget root](#) = new [Widget](#)()
- [Handling handling](#) = new [Handling](#)(this)
- [Rendering rendering](#) = new [Rendering](#)(this)

6.38.1 Constructor & Destructor Documentation

6.38.1.1 Widgets()

```
age.gui.Widgets.Widgets ( )
```

6.38.2 Member Function Documentation

6.38.2.1 `assign()` [1/2]

```
void age.gui.Widgets.assign (
    Events events )
```

6.38.2.2 `assign()` [2/2]

```
void age.gui.Widgets.assign (
    Port port )
```

6.38.2.3 `root()`

```
Widget age.gui.Widgets.root ( )
```

6.38.3 Member Data Documentation

6.38.3.1 `handling`

```
Handling age.gui.Widgets.handling = new Handling(this) [private]
```

6.38.3.2 `rendering`

```
Rendering age.gui.Widgets.rendering = new Rendering(this) [private]
```

6.38.3.3 `root`

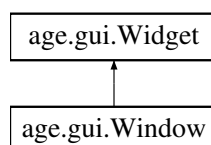
```
Widget age.gui.Widgets.root = new Widget() [private]
```

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

- [D:/GIT/repos/ODE/age/age/gui/Widgets.java](#)

6.39 `age.gui.Window` Class Reference

Inheritance diagram for `age.gui.Window`:



Public Member Functions

- [Window](#) ([Flag](#) ... [flags](#))
- [String title](#) ()
- [void title](#) ([String title](#))
- [Widget getPage](#) ()

Public Member Functions inherited from [age.gui.Widget](#)

- [Widget](#) ([Flag](#) ... [flags](#))
- [float x](#) ()
- [float y](#) ()
- [float width](#) ()
- [float height](#) ()
- [Vector2f position](#) ()
- [Vector2f dimension](#) ()
- [Dock dock](#) ()
- [void dock](#) ([Dock dock](#))
- [void dock](#) ([float top](#), [float bottom](#), [float left](#), [float right](#))
- [void position](#) ([Vector2f position](#))
- [void position](#) ([float x](#), [float y](#))
- [void positionAdd](#) ([Vector2f position](#))
- [void positionAdd](#) ([float x](#), [float y](#))
- [void dimension](#) ([Vector2f dimension](#))
- [void dimension](#) ([float width](#), [float height](#))
- [void dimensionAdd](#) ([Vector2f dimension](#))
- [void dimensionAdd](#) ([float width](#), [float height](#))
- [Set< Flag > flags](#) ()
- [void flag](#) ([Flag](#) ... [flags](#))
- [void clear](#) ([Flag](#) ... [flags](#))
- [boolean match](#) ([Flag](#) ... [flags](#))
- [Widget parent](#) ()
- [List< Widget > children](#) ()
- [void add](#) ([Widget child](#))
- [void add](#) ([int idx](#), [Widget child](#))
- [void remove](#) ()
- [void toFront](#) ()
- [String text](#) ()
- [void text](#) ([String text](#))
- [String image](#) ()
- [void image](#) ([String image](#))
- [String command](#) ()
- [void command](#) ([String command](#))

Private Member Functions

- [void construct](#) ()

Private Attributes

- [Widget title](#) = new [Widget](#)()
- [Widget size](#) = new [Widget](#)()
- [Widget close](#) = new [Widget](#)()
- [Widget page](#) = new [Widget](#)()

6.39.1 Constructor & Destructor Documentation

6.39.1.1 Window()

```
age.gui.Window.Window (
    Flag ... flags )
```

6.39.2 Member Function Documentation

6.39.2.1 construct()

```
void age.gui.Window.construct ( ) [private]
```

6.39.2.2 getPage()

```
Widget age.gui.Window.getPage ( )
```

6.39.2.3 title() [1/2]

```
String age.gui.Window.title ( )
```

6.39.2.4 title() [2/2]

```
void age.gui.Window.title (
    String title )
```

6.39.3 Member Data Documentation

6.39.3.1 close

```
Widget age.gui.Window.close = new Widget() [private]
```

6.39.3.2 page

```
Widget age.gui.Window.page = new Widget() [private]
```

6.39.3.3 size

```
Widget age.gui.Window.size = new Widget() [private]
```

6.39.3.4 title

```
Widget age.gui.Window.title = new Widget() [private]
```

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

- [D:/GIT/repos/ODE/age/age/gui/Window.java](#)

Chapter 7

File Documentation

7.1 D:/GIT/repos/ODE/age/age/AGEException.java File Reference

Classes

- class [age.AGEException](#)
Root Exception for AGE.

Packages

- package [age](#)

7.2 D:/GIT/repos/ODE/age/age/Client.java File Reference

```
import age.port.Port;
```

Classes

- class [age.Client](#)
The AGE Application Client main class.

Packages

- package [age](#)

7.3 D:/GIT/repos/ODE/age/age/clock/Alarm.java File Reference

Classes

- class [age.clock.Alarm](#)
This package visible class represents a single alarm schedule that periodically triggers a Task after a preset time period

Packages

- package [age.clock](#)

7.4 D:/GIT/repos/ODE/age/age/clock/Clock.java File Reference

```
import java.util.ArrayList;
```

Classes

- class [age.clock.Clock](#)
The system Clock.

Packages

- package [age.clock](#)

7.5 D:/GIT/repos/ODE/age/age/clock/Task.java File Reference

Classes

- interface [age.clock.Task](#)
The Task interface that defines the call parameters for a Task reference method

Packages

- package [age.clock](#)

7.6 D:/GIT/repos/ODE/age/age/task/Task.java File Reference

Classes

- interface [age.task.Task](#)

Packages

- package [age.task](#)

7.7 D:/GIT/repos/ODE/age/age/event/Button.java File Reference

Classes

- enum [age.event.Button](#)
Enumeration of Pointer Buttons.

Packages

- package [age.event](#)

7.8 D:/GIT/repos/ODE/age/age/event/Event.java File Reference

```
import javax.vecmath.Vector2f;
```

Classes

- class [age.event.Event](#)
This class defines an Event along with its descriptive data.

Packages

- package [age.event](#)

7.9 D:/GIT/repos/ODE/age/age/event/Events.java File Reference

```
import java.util.ArrayList;
```

Classes

- class [age.event.Events](#)

Packages

- package [age.event](#)

7.10 D:/GIT/repos/ODE/age/age/event/Handler.java File Reference

Classes

- interface [age.event.Handler](#)
Interface to define an event handler method reference.

Packages

- package [age.event](#)

7.11 D:/GIT/repos/ODE/age/age/event/Key.java File Reference

Classes

- enum [age.event.Key](#)
Enumeration of Keyboard Keys.

Packages

- package [age.event](#)

7.12 D:/GIT/repos/ODE/age/age/event/Type.java File Reference

Classes

- enum [age.event.Type](#)
Enumeration of Event Types to register to.

Packages

- package [age.event](#)

7.13 D:/GIT/repos/ODE/age/age/gui/Dock.java File Reference

Classes

- class [age.gui.Dock](#)

Packages

- package [age.gui](#)

7.14 D:/GIT/repos/ODE/age/age/gui/Flag.java File Reference

Classes

- enum [age.gui.Flag](#)

Packages

- package [age.gui](#)

7.15 D:/GIT/repos/ODE/age/age/scene/Flag.java File Reference

Classes

- enum [age.scene.Flag](#)

Packages

- package [age.scene](#)

7.16 D:/GIT/repos/ODE/age/age/gui/Handling.java File Reference

```
import java.util.ArrayList;
```

Classes

- class [age.gui.Handling](#)

Packages

- package [age.gui](#)

7.17 D:/GIT/repos/ODE/age/age/gui/Multiline.java File Reference

```
import age.task.Tasks;
```

Classes

- class [age.gui.Multiline](#)

Packages

- package [age.gui](#)

7.18 D:/GIT/repos/ODE/age/age/gui/Rendering.java File Reference

```
import java.util.List;
```

Classes

- class [age.gui.Rendering](#)

Packages

- package [age.gui](#)

7.19 D:/GIT/repos/ODE/age/age/scene/Rendering.java File Reference

```
import javax.vecmath.Matrix4f;
```

Classes

- class [age.scene.Rendering](#)

Packages

- package [age.scene](#)

7.20 D:/GIT/repos/ODE/age/age/gui/VScroller.java File Reference

```
import java.util.UUID;
```

Classes

- class [age.gui.VScroller](#)

Packages

- package [age.gui](#)

7.21 D:/GIT/repos/ODE/age/age/gui/Widget.java File Reference

```
import java.util.ArrayList;
```

Classes

- class [age.gui.Widget](#)

Packages

- package [age.gui](#)

7.22 D:/GIT/repos/ODE/age/age/gui/Widgets.java File Reference

```
import age.event.Events;
```

Classes

- class [age.gui.Widgets](#)

Packages

- package [age.gui](#)

7.23 D:/GIT/repos/ODE/age/age/gui/Window.java File Reference

Classes

- class [age.gui.Window](#)

Packages

- package [age.gui](#)

7.24 D:/GIT/repos/ODE/age/age/log/Level.java File Reference

Classes

- enum [age.log.Level](#)

Enumeration of Log Levels one can choose from that can be enabled/disabled separately.

Packages

- package [age.log](#)

7.25 D:/GIT/repos/ODE/age/age/log/Log.java File Reference

```
import java.io.File;
```

Classes

- class [age.log.Log](#)
Class that provides configurable Logging capabilities.

Packages

- package [age.log](#)

7.26 D:/GIT/repos/ODE/age/age/port/Graphics.java File Reference

```
import javax.vecmath.Color4f;
```

Classes

- interface [age.port.Graphics](#)

Packages

- package [age.port](#)

7.27 D:/GIT/repos/ODE/age/age/port/jogl/JOGLEventListener.java File Reference

```
import com.jogamp.newt.Window;
```

Classes

- class [age.port.jogl.JOGLEventListener](#)

Packages

- package [age.port.jogl](#)

7.28 D:/GIT/repos/ODE/age/age/port/jogl/JOGLGraphics.java File Reference

```
import com.jogamp.opengl.GL2;
```

Classes

- class [age.port.jogl.JOGLGraphics](#)

Packages

- package [age.port.jogl](#)

7.29 D:/GIT/repos/ODE/age/age/port/jogl/JOGLPort.java File Reference

```
import java.util.ArrayList;
```

Classes

- class [age.port.jogl.JOGLPort](#)

Packages

- package [age.port.jogl](#)

7.30 D:/GIT/repos/ODE/age/age/port/jogl/JOGLRenderListener.java File Reference

```
import com.jogamp.opengl.GLAutoDrawable;
```

Classes

- class [age.port.jogl.JOGLRenderListener](#)

Packages

- package [age.port.jogl](#)

7.31 D:/GIT/repos/ODE/age/age/port/Port.java File Reference

```
import age.event.Events;
```

Classes

- interface [age.port.Port](#)

Packages

- package [age.port](#)

7.32 D:/GIT/repos/ODE/age/age/port/Renderable.java File Reference

Classes

- interface [age.port.Renderable](#)

Packages

- package [age.port](#)

7.33 D:/GIT/repos/ODE/age/age/scene/Camera.java File Reference

Classes

- class [age.scene.Camera](#)

Packages

- package [age.scene](#)

7.34 D:/GIT/repos/ODE/age/age/scene/Node.java File Reference

```
import java.util.ArrayList;
```

Classes

- class [age.scene.Node](#)

Packages

- package [age.scene](#)

7.35 D:/GIT/repos/ODE/age/age/scene/Part.java File Reference

```
import javax.vecmath.Matrix4f;
```

Classes

- enum [age.scene.Part](#)

Packages

- package [age.scene](#)

7.36 D:/GIT/repos/ODE/age/age/scene/Scene.java File Reference

```
import age.port.Port;
```

Classes

- class [age.scene.Scene](#)

Packages

- package [age.scene](#)

7.37 D:/GIT/repos/ODE/age/age/task/Tasks.java File Reference

```
import java.util.ArrayList;
```

Classes

- class [age.task.Tasks](#)

Packages

- package [age.task](#)

7.38 D:/GIT/repos/ODE/age/age/Util.java File Reference

```
import java.io.BufferedReader;
```

Classes

- class [age.Util](#)
The AGE Utility class.

Packages

- package [age](#)

7.39 D:/GIT/repos/ODE/age/TODO.java File Reference

Classes

- class [TODO](#)

Index

- [_0](#)
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