SenseGlove Unity Plugin v1.2

Generated by Doxygen 1.8.18

Chapter 1

Namespace Index

1.1 Packages

Here are the packages with brief descriptions (if available):

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

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

Chapter 3

Class Index

3.1 Class List

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

Chapter 4

Namespace Documentation

4.1 SG Namespace Reference

Classes

- class SG_AutoHandAnimation

  A HandAnimator that grabs its animation info from a SG_HandModelInfo script.
- class SG_BasicFeedback

  Attach to a collider and it will send haptic feedback to a SenseGlove on impact. Optionally tracks a GameObject. Extended by SG_Finger to apply more forces.
- class SG_Breakable

  A Gameobject that despawns an objects once its material breaks, and optionally replaces it with a 'broken' version.
- class SG_BreakableContainer

  A SenseGlove_Breakable that contains objects and optionally spawns shards of itself upon breaking.
- class SG_Debugger

  Utility Script that allows access to the internal debugger of the SenseGloveCs Library, and controls debug messages from the SenseGlove SDK specifically.
- class SG_DetectGrab

  Attach this to any GameObject with a collider to have SG_Grabscripts detect it. Does not add any manipulation.
- class SG_DeviceLink

  Link to a Sense Glove Device.
- class SG_DeviceManager

  Class that links SenseGlove hardware to object in the Unity Engine.
- class SG_Dial

  A knob that can be twisted along its axis. Used in intricate button panels.
- class SG_Door

  A SenseGlove_Hinge that represents a door. Can raise opened / closed events and have hidden content.
- class SG_Drawer

  A SG_Interactable that moves along one (local) axis.
- class SG_DropZone

  Detects SenseGlove_Grabables within its volume.
- class SG_FingerFeedback

  Extends impact feedback to also take into account force feedback from SG_Material's. These scripts calculate their distance into a collider.
- class SG_GestureGrabScript

  A simplified SenseGlove_GrabScript that grabs all objects within it's 'hover collider' when a grab gestire is made.

- class SG_Grabable

  An object that can be picked up and dropped by the SenseGlove.
- class SG_GrabScript

  A Grabscript that uses a number of the Sense Glove's data to start and end interactions.
- class SG_GrabZone

  Creates a zone that extends its SG_Interactable methods to other objects, essentially creating a handle for (multiple) other Interactables.
- class SG_HandAnimator

  A Generic Script that can be extended to work with most hand models. It requires the developer to assign the correct transforms for each joint. All of its methods can be overridden to create custom solutions.
- class SG_HandDetector

  A class to detect a SG_HandAnimator based on its SG_Feedback colliders
- class SG_HandFeedback

  This script collects the Force Feedback from the hand and sends these to its connected Hardware.
- class SG_HandModelInfo

  A script to assign information of hand joints, used by other scripts that use hand tracking.
- class SG_HandRigidBodies

  A script to manage a set of Rigidbodies that represent the hand geometry.
- class SG_HandTrigger

  A Detector that, when activated, triggers a series of in-game effects.
- class SG_Hinge

  Represents an Interactable that can rotate around a specified point and axis. Used to extend doors and levers.
- class SG_HoverCollider

  A script that keeps track of multiple SG_Interactable objects it collides with.
- class SG_Interactable

  Represents an object that a SenseGlove Grabscript can interact with. Extended by most of the Interaction scripts.
- class SG_InteractArgs

  Contains event arguments
- class SG_KeyBinds

  A Keybinds component that can be attached to a TrackedHand so we may access certain functions through buttons or hotkeys.
- class SG_Material

  A class that contains material properties for a virtual objects, which can be customized, hard-coded or loaded during runtime.
- class SG_MeshDeform

  A class that can hook itself up to a SG_Interactable or material, and deform its mesh.
- class SG_PhysicsGrab

  A simplified version of the original SenseGlove_PhysGrab script; If an object is touched by finger-thumb or by palm-finger
- class SG_SenseGloveData

  Unity wrapper for the GloveData, which contains all a developer will need.
- class SG_SenseGloveHardware

  After being linked to a proper Sense Glove via the SenseGlove_DeviceManager, this script is responsible for updating SG_SenseGloveData every frame, and for exposing feedback - and calibration methods.
- class SG_SimpleTracking

  Attached to a GameObject to make it follow a 'target'
- class SG_SnapDropZone

  A DropZone that snaps a Grabable to a specific SnapPoint.
- class SG_TrackedBody

  A Rigidbody that tracks a transform by adding velocity to the body, rather than directly applying positions. It reverts back to simpleTrackign if no Rigidbody is present.
- class SG_TrackedHand

A hand model with different layers, that follows a GameObject with a configurable offset
- class SG_User

  Utility Class to manage up to two SG_TrackedHands, and to swap their hands around.
- class SG_Util

  Contains methods that make the SenseGloveCs library work with Unity.
- class SG_WireFrame

  Type of SG_HandAnimator to debug hardware- and software models.
- class SGEvent

Enumerations

- enum GloveSide { GloveSide.Unknown = 0, GloveSide.RightHand, GloveSide.LeftHand }

  Whether this glove is left- or right handed.
- enum SG_HandSection {
  Thumb = 0, **Index**, **Middle**, **Ring**,
  Pinky, **Wrist**, **Unknown** }

  Represents different sections of the hand, used to determine feedback location.
- enum MovementAxis { **X** = 0, **Y** = 1, **Z** = 2 }

  The axis along which the drawer is moved.
- enum GrabType { GrabType.Follow = 0, GrabType.FixedJoint, GrabType.Parent }

  The way in which this Grabscript picks up SG_Interactable objects.
- enum AttachType { AttachType.Default = 0, AttachType.SnapToAnchor }

  The way that this SG_Grabable attaches to a GrabScript that tries to pick it up.
- enum ReleaseMethod { ReleaseMethod.Default = 0, ReleaseMethod.MustOpenHand, ReleaseMethod.FunctionCall
  }

  Parameter that determines how this object ends its interaction.

4.1.1 Enumeration Type Documentation

4.1.1.1 AttachType

`enum SG.AttachType [strong]`

The way that this SG_Grabable attaches to a GrabScript that tries to pick it up.

Enumerator

Default	Default. The object keeps its current position.
SnapToAnchor	The object snaps to the Grabscript in a predefined position and orientation; useful for tools etc.

4.1.1.2 GloveSide

`enum SG.GloveSide [strong]`

Whether this glove is left- or right handed.

Enumerator

Unknown	No data about this glove is available yet.
RightHand	This is a right hand.
LeftHand	This is a left hand.

4.1.1.3 GrabType

```
enum SG.GrabType  [strong]
```

The way in which this Grabscript picks up SG_Interactable objects.

Enumerator

Follow	The grabbed object's transform follows that of the GrabReference through world coordinates. Does not interfere with VRTK scripts.
FixedJoint	A FixedJoint is created between the grabbed object and the GrabReference, which stops it from passing through rigidbodies.
Parent	The object becomes a child of the Grabreference. Its original parent is restored upon release.

4.1.1.4 MovementAxis

```
enum SG.MovementAxis  [strong]
```

The axis along which the drawer is moved.

4.1.1.5 ReleaseMethod

```
enum SG.ReleaseMethod  [strong]
```

Parameter that determines how this object ends its interaction.

Enumerator

Default	The Interactable behaves as determined by the GrabScript that interacts with it.
MustOpenHand	The Interactable may only be released if the Hand is sufficiently "open". Used to improve interaction of objects that move along specified paths.
FunctionCall	The interactable is only released when the EndInteraction or ResetObject functions are called.

4.1.1.6 SG_HandSection

```
enum SG.SG_HandSection  [strong]
```

Represents different sections of the hand, used to determine feedback location.

4.2 SG.Calibration Namespace Reference

Classes

- class CalibrationPose

  Configurable Calibration poses for SenseGlove solvers. Tweak at thyne own risk.
- class SG_CalibrationSequence

  Manobehaviour meant to run the user though two general calibration steps, and then allows them to refine their calibration
- class SG_CalibrationStorage

  Class responsible for storing and retrieving Sense Glove calibration on disk.

4.3 SG.Examples Namespace Reference

Classes

- class SGEx_Diagnostics

  Allows one to access certain Sense Glove fucntions using the keys on the keyboard.
- class SGEx_ForceFeedbackObjects
- class SGEx_HandLayerUI
- class SGEx_RotateSimple

  A script to rotate an object around a specified axis
- class SGEx_SelectHandModel
- class SGEx_ShowGloveAngles

4.4 SG.Materials Namespace Reference

Classes

- struct Deformation

  Contains all variables needed to perform Deformations, and to evaluate two deformations.
- struct MaterialProps

  Contains the editable Material Properties of a single SenseGlove_Material

Enumerations

- enum VirtualMaterial { VirtualMaterial.Custom = 0, VirtualMaterial.Steel, VirtualMaterial.Rubber, VirtualMaterial.Egg }

  Determines how the material properties are loaded.
- enum DisplaceType { DisplaceType.Plane = 0 }

  The method by which the mesh will be displaced using the SenseGlove_Feedback entry vector.

4.4.1 Enumeration Type Documentation

4.4.1.1 DisplaceType

```
enum SG.Materials.DisplaceType  [strong]
```

The method by which the mesh will be displaced using the SenseGlove_Feedback entry vector.

Enumerator

Plane	Squashed the vertices as though they are pressed against a glass window.

4.4.1.2 VirtualMaterial

```
enum SG.Materials.VirtualMaterial  [strong]
```

Determines how the material properties are loaded.

Enumerator

Custom	Material Properties can be assigned via the inspector.
Steel	Assigns properties of the hardest material.
Rubber	Assigns properties of a medium-soft material.
Egg	Assigns properties of a soft material that is breakable.

4.5 SG.Util Namespace Reference

Classes

- class FileIO

  Ensures that .txt files are properly handled by Unity.
- class SG_QuitKey
- class SG_ResetFloor

Chapter 5

Class Documentation

5.1 SG.SG_SenseGloveHardware.BuzzCmd Class Reference

Public Member Functions

- **BuzzCmd** (bool[ ] fin, int[ ] magn, int[ ] dur)
- void **Update** (float deltaTime)
- void **Merge** (ref int[ ] buffer)

Public Attributes

- bool[ ] **fingers**
- float[ ] **durations**
- float[ ] **times**
- int[ ] **magnitudes**

Static Public Attributes

- static readonly BuzzMotorPattern[ ] **patterns**

Protected Attributes

- int **elapsed** = 0

Properties

- bool **FullyElapsed** `[get]`

5.1.1 Member Data Documentation

5.1.1.1 patterns

```
readonly BuzzMotorPattern [ ] SG.SG_SenseGloveHardware.BuzzCmd.patterns  [static]
```

Initial value:
```
= new BuzzMotorPattern[5]
            { BuzzMotorPattern.Constant, BuzzMotorPattern.Constant,
                BuzzMotorPattern.Constant, BuzzMotorPattern.Constant, BuzzMotorPattern.Constant }
```

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Devices/SG_SenseGlove↩ Hardware.cs

5.2 SG.Calibration.CalibrationPose Class Reference

Configurable Calibration poses for SenseGlove solvers. Tweak at thyne own risk.

Public Member Functions

- CalibrationPose (int[ ][ ] affects, int[ ][ ] valueIndices)

  Create a new pose that does not affect output (y) components
- CalibrationPose (int[ ][ ] affects, int[ ][ ] valueIndices, int[ ][ ] yAffects, float[ ][ ] yValues)

  Create a new pose that affects output (y) components
- void CalibrateParameters (Vector3[ ] calibrationValues, ref InterpolationSet_IMU interpolator)

  Calibrate all parameters of an InterpolationSet, based on this pose's parameters and a set of input values.

Static Public Member Functions

- static CalibrationPose GetFist (ref InterpolationSet_IMU interpolator)

  Generates a calibration pose that corresponds to all fingers flexed (finger flexion calibration).
- static CalibrationPose GetOpenHand (ref InterpolationSet_IMU interpolator)

  Generates a calibration pose that corresponds to all fingers extended (finger extension calibration).
- static CalibrationPose GetThumbsUp (ref InterpolationSet_IMU interpolator)

  Generates a calibration pose that corresponds to a thumb up (thumb extended calibration)
- static CalibrationPose GetThumbFlexed (ref InterpolationSet_IMU interpolator)

  Generates a calibration pose that corresponds to a flexed thumb (thumb flexed calibration)
- static CalibrationPose GetThumbAbd (ref InterpolationSet_IMU interpolator)

  Generates a calibration pose that corresponds to a thumb moved outwards (thumb abduction calibration)
- static CalibrationPose GetThumbNoAbd (ref InterpolationSet_IMU interpolator)

  Generates a calibration pose that corresponds to a thumb flat against the hand palm (thumb adduction calibration)
- static CalibrationPose GetFullOpen (ref InterpolationSet_IMU interpolator)

  Generates a calibration pose that corresponds to a fully opened hand (finger extension, thumb adduction calibration)
- static CalibrationPose GetFullFist (ref InterpolationSet_IMU interpolator)

  Generates a calibration pose that corresponds to a fully gclosed hand (finger flexion, thumb abduction calibration)

Static Protected Member Functions

- static int[ ][ ] SetupArray (ref InterpolationSet_IMU interpolator)
  Utility function that creates an array of integers of the appropriate size, with default values -1 (none)
- static float[ ][ ] SetupFloatArray (ref InterpolationSet_IMU interpolator)
  Utility function that creates an array of floats of the appropriate size, with default values 0

Static Protected Attributes

- static readonly int x0 = 0
  Useful indices for interpolation
- static readonly int abd = 2
  Useful indices for movements

Private Attributes

- int[ ][ ] xAffect
  indicates this pose is meant to calibrate the x0 (0) or x1 (1) value for this finger, or no value at all (-1)
- int[ ][ ] calbrUsing
  Which value to use for calibration (flexion, abduction, twist, none)
- int[ ][ ] yAffect
  indicates this pose is meant to calibrate the y0 (0) or y1 (1) value for this finger, or no value at all (-1)
- float[ ][ ] yValue
  //the y value to set, in case this motion sets the output (y) component.

Static Private Attributes

- static readonly int **x1** = 1
- static readonly int **none** = -1
- static readonly int **y0** = 0
- static readonly int **y1** = 1
- static readonly int **flex** = 1
- static readonly int **tw** = 0

5.2.1 Detailed Description

Configurable Calibration poses for SenseGlove solvers. Tweak at thyne own risk.

5.2.2 Constructor & Destructor Documentation

5.2.2.1 CalibrationPose() `[1/2]`

```
SG.Calibration.CalibrationPose.CalibrationPose (
             int affects[ ][ ],
             int valueIndices[ ][ ] )
```

Create a new pose that does not affect output (y) components

Parameters

affects	
valueIndices	

5.2.2.2 CalibrationPose() `[2/2]`

```
SG.Calibration.CalibrationPose.CalibrationPose (
             int affects[ ][ ],
             int valueIndices[ ][ ],
             int yAffects[ ][ ],
             float yValues[ ][ ] )
```

Create a new pose that affects output (y) components

Parameters

affects	
valueIndices	
yAffects	
yValues	

5.2.3 Member Function Documentation

5.2.3.1 CalibrateParameters()

```
void SG.Calibration.CalibrationPose.CalibrateParameters (
             Vector3[ ] calibrationValues,
             ref InterpolationSet_IMU interpolator )
```

Calibrate all parameters of an InterpolationSet, based on this pose's parameters and a set of input values.

Parameters

calibrationValues	
interpolator	

5.2.3.2 GetFist()

```
static CalibrationPose SG.Calibration.CalibrationPose.GetFist (
             ref InterpolationSet_IMU interpolator )  [static]
```

Generates a calibration pose that corresponds to all fingers flexed (finger flexion calibration).

Parameters

interpolator	

Returns

5.2.3.3 GetFullFist()

```
static CalibrationPose SG.Calibration.CalibrationPose.GetFullFist (
             ref InterpolationSet_IMU interpolator )  [static]
```

Generates a calibration pose that corresponds to a fully gclosed hand (finger flexion, thumb abduction calibration)

Parameters

interpolator	

Returns

5.2.3.4 GetFullOpen()

```
static CalibrationPose SG.Calibration.CalibrationPose.GetFullOpen (
             ref InterpolationSet_IMU interpolator )  [static]
```

Generates a calibration pose that corresponds to a fully opened hand (finger extension, thumb adduction calibration)

Parameters

interpolator	

Returns

5.2.3.5 GetOpenHand()

```
static CalibrationPose SG.Calibration.CalibrationPose.GetOpenHand (
            ref InterpolationSet_IMU interpolator )  [static]
```

Generates a calibration pose that corresponds to all fingers extended (finger extension calibration).

Parameters

interpolator	

Returns

5.2.3.6 GetThumbAbd()

```
static CalibrationPose SG.Calibration.CalibrationPose.GetThumbAbd (
            ref InterpolationSet_IMU interpolator )  [static]
```

Generates a calibration pose that corresponds to a thumb moved outwards (thumb abduction calibration)

Parameters

interpolator	

Returns

5.2.3.7 GetThumbFlexed()

```
static CalibrationPose SG.Calibration.CalibrationPose.GetThumbFlexed (
            ref InterpolationSet_IMU interpolator )  [static]
```

Generates a calibration pose that corresponds to a flexed thumb (thumb flexed calibration)

Parameters

interpolator	

Returns

5.2.3.8 GetThumbNoAbd()

```
static CalibrationPose SG.Calibration.CalibrationPose.GetThumbNoAbd (
            ref InterpolationSet_IMU interpolator )  [static]
```

Generates a calibration pose that corresponds to a thumb flat against the hand palm (thumb adduction calibration)

Parameters

interpolator	

Returns

5.2.3.9 GetThumbsUp()

```
static CalibrationPose SG.Calibration.CalibrationPose.GetThumbsUp (
            ref InterpolationSet_IMU interpolator )  [static]
```

Generates a calibration pose that corresponds to a thumb up (thumb extended calibration)

Parameters

interpolator	

Returns

5.2.3.10 SetupArray()

```
static int [][] SG.Calibration.CalibrationPose.SetupArray (
            ref InterpolationSet_IMU interpolator )  [static], [protected]
```

Utility function that creates an array of integers of the appropriate size, with default values -1 (none)

Parameters

interpolator	

Returns

5.2.3.11 SetupFloatArray()

```
static float [][] SG.Calibration.CalibrationPose.SetupFloatArray (
            ref InterpolationSet_IMU interpolator )  [static], [protected]
```

Utility function that creates an array of floats of the appropriate size, with default values 0

Parameters

interpolator	

Returns

5.2.4 Member Data Documentation

5.2.4.1 abd

```
readonly int SG.Calibration.CalibrationPose.abd = 2  [static], [protected]
```

Useful indices for movements

5.2.4.2 calbrUsing

```
int [][] SG.Calibration.CalibrationPose.calbrUsing  [private]
```

Which value to use for calibration (flexion, abduction, twist, none)

5.2.4.3 x0

```
readonly int SG.Calibration.CalibrationPose.x0 = 0  [static], [protected]
```

Useful indices for interpolation

5.2.4.4 xAffect

```
int [][] SG.Calibration.CalibrationPose.xAffect  [private]
```

indicates this pose is meant to calibrate the x0 (0) or x1 (1) value for this finger, or no value at all (-1)

5.2.4.5 yAffect

```
int [][] SG.Calibration.CalibrationPose.yAffect  [private]
```

indicates this pose is meant to calibrate the y0 (0) or y1 (1) value for this finger, or no value at all (-1)

5.2.4.6 yValue

```
float [][] SG.Calibration.CalibrationPose.yValue  [private]
```

//the y value to set, in case this motion sets the output (y) component.

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Calibration/Resources/SG_↩ CalibrationPoses.cs

5.3 SG.Materials.Deformation Struct Reference

Contains all variables needed to perform Deformations, and to evaluate two deformations.

Public Member Functions

- Deformation (Vector3 absEntryVect, Vector3 absDefPosition, float dist)

  Create a new Deformation data struct.

Public Attributes

- Vector3 absEntryVector

  The absolute entry vector of the Deformation
- Vector3 absDeformPosition

  The (current) absulute position of the deformation.
- float distance

  How far the abdDeformPosition is from the entry point

5.3.1 Detailed Description

Contains all variables needed to perform Deformations, and to evaluate two deformations.

5.3.2 Constructor & Destructor Documentation

5.3.2.1 Deformation()

```
SG.Materials.Deformation.Deformation (
             Vector3 absEntryVect,
             Vector3 absDefPosition,
             float dist )
```

Create a new Deformation data struct.

Parameters

absEntryVect	
absPosition	
dist	

5.3.3 Member Data Documentation

5.3.3.1 absDeformPosition

```
Vector3 SG.Materials.Deformation.absDeformPosition
```

The (current) absulute position of the deformation.

5.3.3.2 absEntryVector

```
Vector3 SG.Materials.Deformation.absEntryVector
```

The absolute entry vector of the Deformation

5.3.3.3 distance

```
float SG.Materials.Deformation.distance
```

How far the abdDeformPosition is from the entry point

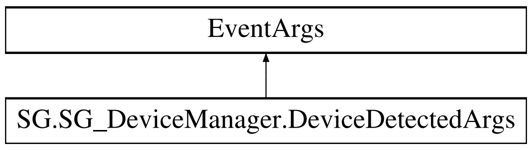
The documentation for this struct was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Feedback/SG_Mesh↩
Deform.cs

5.4 SG.SG_DeviceManager.DeviceDetectedArgs Class Reference

Arguments for the GloveDetected Event.

Inheritance diagram for SG.SG_DeviceManager.DeviceDetectedArgs:



Public Member Functions

- DeviceDetectedArgs (string id, int gloveIndex, SenseGloveCs.DeviceType deviceType)
    Create a new instance of the GloveDetectedArgs.

Properties

- string DeviceID `[get, private set]`
    The unique hardware ID of the detected glove.
- int DeviceIndex `[get, private set]`
    The index of the detected glove within the SenseGlove_DeviceManager memory.
- SenseGloveCs.DeviceType Type `[get, private set]`
    The DeviceType that has been found

5.4.1 Detailed Description

Arguments for the GloveDetected Event.

5.4.2 Constructor & Destructor Documentation

5.4.2.1 DeviceDetectedArgs()

```
SG.SG_DeviceManager.DeviceDetectedArgs.DeviceDetectedArgs (
            string id,
            int gloveIndex,
            SenseGloveCs.DeviceType deviceType )
```

Create a new instance of the GloveDetectedArgs.

Parameters

glove	

5.4.3 Property Documentation

5.4.3.1 DeviceID

```
string SG.SG_DeviceManager.DeviceDetectedArgs.DeviceID  [get], [private set]
```

The unique hardware ID of the detected glove.

5.4.3.2 DeviceIndex

```
int SG.SG_DeviceManager.DeviceDetectedArgs.DeviceIndex  [get], [private set]
```

The index of the detected glove within the SenseGlove_DeviceManager memory.

5.4.3.3 Type

```
SenseGloveCs.DeviceType SG.SG_DeviceManager.DeviceDetectedArgs.Type  [get], [private set]
```

The DeviceType that has been found

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Devices/SG_Device←Manager.cs

5.5 SG.SG_DropZone.DropProps Class Reference

Properties that assist in object detection.

Public Attributes

- float **insideTime**
- bool **detected**

5.5.1 Detailed Description

Properties that assist in object detection.

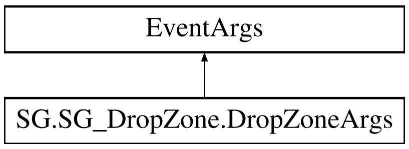
Placed inside a class to reduce the amount of List<> parameters.

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Controls/SG_DropZone.cs

5.6 SG.SG_DropZone.DropZoneArgs Class Reference

Inheritance diagram for SG.SG_DropZone.DropZoneArgs:



Public Member Functions

- DropZoneArgs (SG_Grabable obj)
  Create a new instance of the DropZoneArgs.

Public Attributes

- SG_Grabable grabable
  The object that was detected or removed.

5.6.1 Constructor & Destructor Documentation

5.6.1.1 DropZoneArgs()

```
SG.SG_DropZone.DropZoneArgs.DropZoneArgs (
            SG_Grabable obj )
```

Create a new instance of the DropZoneArgs.

Parameters

obj	

5.6.2 Member Data Documentation

5.6.2.1 grabable

```
SG_Grabable SG.SG_DropZone.DropZoneArgs.grabable
```

The object that was detected or removed.

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Controls/SG_DropZone.cs

5.7 SG.Util.FileIO Class Reference

Ensures that .txt files are properly handled by Unity.

Static Public Member Functions

- static bool SaveTxtFile (string dir, string fileName, string[ ] lines, bool append=false)

  Attempt to save a string[] to a filename within a desired directory. Returns true if succesful.
- static bool ReadTxtFile (string path, out string[ ] lines)

  Attempt to read all lines from a file and place them in the string[]. Returns true if succesful. If unable to open the file, the string[] will be empty.

5.7.1 Detailed Description

Ensures that .txt files are properly handled by Unity.

5.7.2 Member Function Documentation

5.7.2.1 ReadTxtFile()

```
static bool SG.Util.FileIO.ReadTxtFile (
              string path,
              out string[ ] lines )  [static]
```

Attempt to read all lines from a file and place them in the string[]. Returns true if succesful. If unable to open the file, the string[] will be empty.

Parameters

path	
lines	

Returns

5.7.2.2 SaveTxtFile()

```
static bool SG.Util.FileIO.SaveTxtFile (
             string dir,
             string fileName,
             string[] lines,
             bool append = false )  [static]
```

Attempt to save a string[] to a filename within a desired directory. Returns true if succesful.

Directory is added as a separate variable so we can more easily check for its existence.

Parameters

dir	
fileName	
lines	
append	

Returns

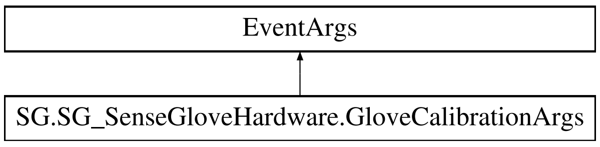
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Util/SG_FileIO.cs

5.8 SG.SG_SenseGloveHardware.GloveCalibrationArgs Class Reference

CalibrationArguments, containing both old an new finger lengths and joint positions.

Inheritance diagram for SG.SG_SenseGloveHardware.GloveCalibrationArgs:



Public Member Functions

- GloveCalibrationArgs (SenseGloveCs.CalibrationArgs args)

    Creates a new instance of the unity-friendly calibration args.
- GloveCalibrationArgs (SG_SenseGloveData oldD, SG_SenseGloveData newD)

    Creates a new instance of the unity-friendly calibration args.

Public Attributes

- SG_SenseGloveData oldData

    'Snapshot' of the old data, with old parameters
- SG_SenseGloveData newData

    'Snapshot' of the new data, with updated parameters

5.8.1 Detailed Description

CalibrationArguments, containing both old an new finger lengths and joint positions.

5.8.2 Constructor & Destructor Documentation

5.8.2.1 GloveCalibrationArgs() [1/2]

```
SG.SG_SenseGloveHardware.GloveCalibrationArgs.GloveCalibrationArgs (
            SenseGloveCs.CalibrationArgs args )
```

Creates a new instance of the unity-friendly calibration args.

Parameters

args	

5.8.2.2 GloveCalibrationArgs() [2/2]

```
SG.SG_SenseGloveHardware.GloveCalibrationArgs.GloveCalibrationArgs (
            SG_SenseGloveData oldD,
            SG_SenseGloveData newD )
```

Creates a new instance of the unity-friendly calibration args.

Parameters

args	

5.8.3 Member Data Documentation

5.8.3.1 newData

`SG_SenseGloveData SG.SG_SenseGloveHardware.GloveCalibrationArgs.newData`

'Snapshot' of the new data, with updated parameters

5.8.3.2 oldData

`SG_SenseGloveData SG.SG_SenseGloveHardware.GloveCalibrationArgs.oldData`

'Snapshot' of the old data, with old parameters

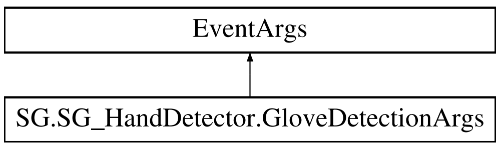
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Devices/SG_SenseGlove↩ Hardware.cs

5.9 SG.SG_HandDetector.GloveDetectionArgs Class Reference

EventArgs fired when a glove is detected in or removed from a SenseGlove_Detector.

Inheritance diagram for SG.SG_HandDetector.GloveDetectionArgs:



Public Member Functions

- GloveDetectionArgs (SG_SenseGloveHardware model)

  Create a new instance of the SenseGlove Detection Arguments

Public Attributes

- SG_SenseGloveHardware handModel

  The Grabscript that caused the event to fire.

5.9.1 Detailed Description

EventArgs fired when a glove is detected in or removed from a SenseGlove_Detector.

5.9.2 Constructor & Destructor Documentation

5.9.2.1 GloveDetectionArgs()

```
SG.SG_HandDetector.GloveDetectionArgs.GloveDetectionArgs (
            SG_SenseGloveHardware model )
```

Create a new instance of the SenseGlove Detection Arguments

Parameters

grab	

5.9.3 Member Data Documentation

5.9.3.1 handModel

```
SG_SenseGloveHardware SG.SG_HandDetector.GloveDetectionArgs.handModel
```

The Grabscript that caused the event to fire.

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Controls/SG_Hand↩ Detector.cs

5.10 SG.Materials.MaterialProps Struct Reference

Contains the editable Material Properties of a single SenseGlove_Material

Public Member Functions

- MaterialProps (SG_Material material)

  Convert a SenseGlove_Material into a MaterialProps, which can be passed between scripts or stored later on.

Static Public Member Functions

- static MaterialProps Default ()

  Retrieve a 'default' material.
- static MaterialProps Parse (List< string > dataBlock)

  Parse a DataBlock into a MaterialProps. Any missing variables will be set to their default value.

Public Attributes

- int maxForce

  The maximum force that this material can put on the Sense Glove.
- float maxForceDist

  The distance [m] where the maximum force has been reached. Setting it to 0 will instantly send maxForce on touch
- float yieldDist

  The distance [m] at which the material breaks.
- int hapticForce

  The magnitude [0..100%] of the buzz motor pulse
- int hapticDur

  The duration of the Haptic Feedback, in miliseconds

Static Private Member Functions

- static bool TryGetRawValue (string line, out string raw)

  Attempt to retieve the (raw) value of this material property.
- static bool TryGetFloat (string line, out float res)

  Attempt to convert a specific property to a floating point.

5.10.1 Detailed Description

Contains the editable Material Properties of a single SenseGlove_Material

5.10.2 Constructor & Destructor Documentation

5.10.2.1 MaterialProps()

```
SG.Materials.MaterialProps.MaterialProps (
            SG_Material material )
```

Convert a SenseGlove_Material into a MaterialProps, which can be passed between scripts or stored later on.

Parameters

material	

5.10.3 Member Function Documentation

5.10.3.1 Default()

```
static MaterialProps SG.Materials.MaterialProps.Default ( )  [static]
```

Retrieve a 'default' material.

Returns

5.10.3.2 Parse()

```
static MaterialProps SG.Materials.MaterialProps.Parse (
             List< string > dataBlock )  [static]
```

Parse a DataBlock into a MaterialProps. Any missing variables will be set to their default value.

Parameters

dataBlock	

Returns

5.10.3.3 TryGetFloat()

```
static bool SG.Materials.MaterialProps.TryGetFloat (
             string line,
             out float res )  [static], [private]
```

Attempt to convert a specific property to a floating point.

Parameters

line	
res	

Returns

5.10.3.4 TryGetRawValue()

```
static bool SG.Materials.MaterialProps.TryGetRawValue (
             string line,
             out string raw )  [static], [private]
```

Attempt to retieve the (raw) value of this material property.

Parameters

line	
raw	

Returns

5.10.4 Member Data Documentation

5.10.4.1 hapticDur

```
int SG.Materials.MaterialProps.hapticDur
```

The duration of the Haptic Feedback, in miliseconds

5.10.4.2 hapticForce

```
int SG.Materials.MaterialProps.hapticForce
```

The magnitude [0..100%] of the buzz motor pulse

5.10.4.3 maxForce

```
int SG.Materials.MaterialProps.maxForce
```

The maximum force that this material can put on the Sense Glove.

5.10.4.4 maxForceDist

```
float SG.Materials.MaterialProps.maxForceDist
```

The distance [m] where the maximum force has been reached. Setting it to 0 will instantly send maxForce on touch

5.10.4.5 yieldDist

```
float SG.Materials.MaterialProps.yieldDist
```

The distance [m] at which the material breaks.

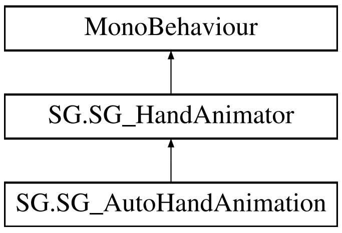
The documentation for this struct was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Feedback/SG_Material.cs

5.11 SG.SG_AutoHandAnimation Class Reference

A HandAnimator that grabs its animation info from a SG_HandModelInfo script.

Inheritance diagram for SG.SG_AutoHandAnimation:



Public Attributes

- SG_HandModelInfo handModelInfo

  teh HandModelInfo that this scripts animates.

Protected Member Functions

- override void CollectFingerJoints ()

  Assign the joints of this script so that the SG_HandAnimator script takes over animation.
- override void CheckForScripts ()

  Check for relevant linked scripts for this HandAnimator, specifically to the SG_HandModelInfo.
- override void Start ()

  If we have HandModelInfo, we can already collect joints

Additional Inherited Members

5.11.1 Detailed Description

A HandAnimator that grabs its animation info from a SG_HandModelInfo script.

5.11.2 Member Function Documentation

5.11.2.1 CheckForScripts()

```
override void SG.SG_AutoHandAnimation.CheckForScripts ( )  [protected], [virtual]
```

Check for relevant linked scripts for this HandAnimator, specifically to the SG_HandModelInfo.

Reimplemented from SG.SG_HandAnimator.

5.11.2.2 CollectFingerJoints()

```
override void SG.SG_AutoHandAnimation.CollectFingerJoints ( )  [protected], [virtual]
```

Assign the joints of this script so that the SG_HandAnimator script takes over animation.

Implements SG.SG_HandAnimator.

5.11.2.3 Start()

```
override void SG.SG_AutoHandAnimation.Start ( )  [protected], [virtual]
```

If we have HandModelInfo, we can already collect joints

Reimplemented from SG.SG_HandAnimator.

5.11.3 Member Data Documentation

5.11.3.1 handModelInfo

`SG_HandModelInfo SG.SG_AutoHandAnimation.handModelInfo`

teh HandModelInfo that this scripts animates.

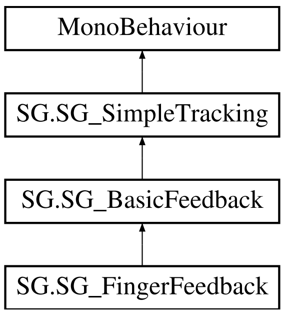
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Tracking/SG_AutoHand↩ Animation.cs

5.12 SG.SG_BasicFeedback Class Reference

Attach to a collider and it will send haptic feedback to a SenseGlove on impact. Optionally tracks a GameObject. Extended by SG_Finger to apply more forces.

Inheritance diagram for SG.SG_BasicFeedback:



Public Member Functions

- virtual void SetupSelf ()

  Setup the SG_BasicFeedback script components
- void SendImpactFeedback (float impactVelocity)

  Send an impact vibration to this script's connected glove, based on a speed in m/s.

Public Attributes

- SG_SenseGloveHardware linkedGlove

  Sense Glove that will receive the feedback effect
- SG_HandSection handLocation = SG_HandSection.Unknown

  The part of the hand that this script belongs to.
- bool impactFeedbackEnabled = true

  If true, this script will send vibrotactile feedback on impact.
- float impactCooldown = 0.5f

  The minimum time, in seconds, between impact vibration.
- float minImpactSpeed = 0.01f

  The minimum speed, in m\s, that this object must make before an impact is played.
- float maxImpactSpeed = 0.1f

  The speed, in m/s, where the maxiumum vibration level is sent.
- AnimationCurve impactProfile = AnimationCurve.Linear(0, 0, 1, 1)

  A curve that determines how the impact vibration varies between the minimum and maximum impact speed. Set to constant (1) to have the same vibration no matter the speed.

Static Public Attributes

- static int maxVelocityPoints = 10

  The maximum frames for which to keep track of velocity.

Protected Member Functions

- override void UpdatePosition ()

  Update this collider's position, and register its velocity.
- override void **Awake** ()
- override void **FixedUpdate** ()
- virtual void **OnTriggerEnter** (Collider other)

Protected Attributes

- List< Vector3 > velocities = new List<Vector3>()

  The xyz velocities during the last few frames, used to determine the average impact velocity.
- Vector3 lastPosition = Vector3.zero

  This object's position during the last frame, used to determine velocity.
- float cooldownTimer = 0

  Keeps track of time since last vibration

Static Protected Attributes

- static int minBuzzLevel = 50

  The minimum vibration level at which an impact can be felt.
- static int maxBuzzLevel = 80

  The maximum vibration level to represent an impact.
- static int vibrationTime = 100

  The time to vibrate the buzz motors for.

Properties

- override bool DebugEnabled `[get, set]`

  Used to show or hide this object's collider.
- bool CanImpact `[get]`

  Returns true if this script can send an impact vibration
- Vector3 SmoothedVelocity `[get]`

  Returns the average velocity over the last few frames

Additional Inherited Members

5.12.1 Detailed Description

Attach to a collider and it will send haptic feedback to a SenseGlove on impact. Optionally tracks a GameObject. Extended by SG_Finger to apply more forces.

5.12.2 Member Function Documentation

5.12.2.1 SendImpactFeedback()

```
void SG.SG_BasicFeedback.SendImpactFeedback (
             float impactVelocity )
```

Send an impact vibration to this script's connected glove, based on a speed in m/s.

Parameters

impactVelocity	

5.12.2.2 SetupSelf()

```
virtual void SG.SG_BasicFeedback.SetupSelf ( )  [virtual]
```

Setup the SG_BasicFeedback script components

Reimplemented in SG.SG_FingerFeedback.

5.12.2.3 UpdatePosition()

```
override void SG.SG_BasicFeedback.UpdatePosition ( )  [protected], [virtual]
```

Update this collider's position, and register its velocity.

Reimplemented from SG.SG_SimpleTracking.

5.12.3 Member Data Documentation

5.12.3.1 cooldownTimer

```
float SG.SG_BasicFeedback.cooldownTimer = 0  [protected]
```

Keeps track of time since last vibration

5.12.3.2 handLocation

```
SG_HandSection SG.SG_BasicFeedback.handLocation = SG_HandSection.Unknown
```

The part of the hand that this script belongs to.

5.12.3.3 impactCooldown

```
float SG.SG_BasicFeedback.impactCooldown = 0.5f
```

The minimum time, in seconds, between impact vibration.

5.12.3.4 impactFeedbackEnabled

```
bool SG.SG_BasicFeedback.impactFeedbackEnabled = true
```

If true, this script will send vibrotactile feedback on impact.

5.12.3.5 impactProfile

```
AnimationCurve SG.SG_BasicFeedback.impactProfile = AnimationCurve.Linear(0, 0, 1, 1)
```

A curve that determines how the impact vibration varies between the minimum and maximum impact speed. Set to constant (1) to have the same vibration no matter the speed.

5.12.3.6 lastPosition

```
Vector3 SG.SG_BasicFeedback.lastPosition = Vector3.zero  [protected]
```

This object's position during the last frame, used to determine velocity.

5.12.3.7 linkedGlove

```
SG_SenseGloveHardware SG.SG_BasicFeedback.linkedGlove
```

Sense Glove that will receive the feedback effect

5.12.3.8 maxBuzzLevel

```
int SG.SG_BasicFeedback.maxBuzzLevel = 80  [static], [protected]
```

The maximum vibration level to represent an impact.

5.12.3.9 maxImpactSpeed

```
float SG.SG_BasicFeedback.maxImpactSpeed = 0.1f
```

The speed, in m/s, where the maxiumum vibration level is sent.

5.12.3.10 maxVelocityPoints

```
int SG.SG_BasicFeedback.maxVelocityPoints = 10  [static]
```

The maximum frames for which to keep track of velocity.

5.12.3.11 minBuzzLevel

```
int SG.SG_BasicFeedback.minBuzzLevel = 50  [static], [protected]
```

The minimum vibration level at which an impact can be felt.

5.12.3.12 minImpactSpeed

```
float SG.SG_BasicFeedback.minImpactSpeed = 0.01f
```

The minimum speed, in m\s, that this object must make before an impact is played.

5.12.3.13 velocities

```
List<Vector3> SG.SG_BasicFeedback.velocities = new List<Vector3>()  [protected]
```

The xyz velocities during the last few frames, used to determine the average impact velocity.

5.12.3.14 vibrationTime

```
int SG.SG_BasicFeedback.vibrationTime = 100  [static], [protected]
```

The time to vibrate the buzz motors for.

5.12.4 Property Documentation

5.12.4.1 CanImpact

```
bool SG.SG_BasicFeedback.CanImpact  [get]
```

Returns true if this script can send an impact vibration

5.12.4.2 DebugEnabled

```
override bool SG.SG_BasicFeedback.DebugEnabled  [get], [set]
```

Used to show or hide this object's collider.

5.12.4.3 SmoothedVelocity

```
Vector3 SG.SG_BasicFeedback.SmoothedVelocity  [get]
```

Returns the average velocity over the last few frames

Returns

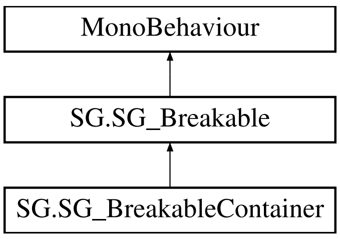
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Feedback/SG_Basic↩ Feedback.cs

5.13 SG.SG_Breakable Class Reference

A Gameobject that despawns an objects once its material breaks, and optionally replaces it with a 'broken' version.

Inheritance diagram for SG.SG_Breakable:



Public Types

- enum UnbreakType { UnbreakType.None = 0, UnbreakType.Unbreak, UnbreakType.Reset }

  How the object will respond after it breaks.

Public Member Functions

- bool IsBroken ()

  Returns true if the wholeObject is currently in its broken state.
- virtual void Break ()

  Break the object: Hide the whole object, optionally show the broken one and play the particle effect(s)
- virtual void UnBreak ()

  Reset the object to before its unbroken state, at the same location of the current broken object.
- virtual void ResetObject ()

  Reset this objects position and materials.
- virtual void CheckUnbreak ()

  Check if this objects needs to be reset, depending on the state and unbreakMethod
- delegate void ObjectBrokenEventHandler (object source, System.EventArgs args)

  Event delegate for the ObjectBreaks EventHandler
- delegate void ObjectUnBrokenEventHandler (object source, System.EventArgs args)

  Event delegate for the ObjectUnBreaks EventHandler

Public Attributes

- SG_Interactable wholeObject

  The Interactable with a material which can break. Represents the 'whole' object
- SG_Interactable brokenObject

  The interactable in its broken state.
- ParticleSystem breakParticles

  Optional Particle System that plays when the object breaks.
- AudioSource breakSound

  Optional sound to play when the material breaks.
- UnbreakType unbreakMethod = UnbreakType.None

  Determines if the Breakable resets back to the whole object after the desired timeframe.
- float checkTime = 1.0f

  The time after which the breakable checks if it needs to reset.

Protected Member Functions

- virtual void **Start** ()
- virtual void **Update** ()
- void OnObjectBreaks ()

  Calls the ObjectBreaks event handler.
- void OnObjectUnBreaks ()

  Calls the ObjectUnBreaks event handler.

Events

- ObjectBrokenEventHandler ObjectBreaks

  Fires when this objects Break() function has been called.
- ObjectUnBrokenEventHandler ObjectUnBreaks

  Fires when this objects UnBreak() function has been called.

Private Member Functions

- void WholeMaterial_MaterialBreaks (object source, System.EventArgs args)

  Fired when the associated material breaks.

Private Attributes

- float resetTime = 0

  Timer to keep track of when this object resets.
- SG_Material wholeMaterial

  SenseGlove_Material of the whole object. Used to catch the OnMaterialBreak event.
- SG_Material brokenMaterial

  SenseGlove_Material of the broken object.
- SG_MeshDeform wholeDeform

  (Optional) deform script of the whole object, to reset if the material breaks
- SG_MeshDeform brokenDeform

  (Optional) deform script of the broken object, to reset if the material unbreaks

5.13.1 Detailed Description

A Gameobject that despawns an objects once its material breaks, and optionally replaces it with a 'broken' version.

5.13.2 Member Enumeration Documentation

5.13.2.1 UnbreakType

```
enum SG.SG_Breakable.UnbreakType  [strong]
```

How the object will respond after it breaks.

Enumerator

None	The object stays broken, and does nothing. Default value.
Unbreak	The object unbreaks after the timer elapses.
Reset	The object fully resets after the timer elapsed.

5.13.3 Member Function Documentation

5.13.3.1 Break()

```
virtual void SG.SG_Breakable.Break ( )  [virtual]
```

Break the object: Hide the whole object, optionally show the broken one and play the particle effect(s)

Reimplemented in SG.SG_BreakableContainer.

5.13.3.2 CheckUnbreak()

```
virtual void SG.SG_Breakable.CheckUnbreak ( )  [virtual]
```

Check if this objects needs to be reset, depending on the state and unbreakMethod

5.13.3.3 IsBroken()

```
bool SG.SG_Breakable.IsBroken ( )
```

Returns true if the wholeObject is currently in its broken state.

Returns

5.13.3.4 ObjectBrokenEventHandler()

```
delegate void SG.SG_Breakable.ObjectBrokenEventHandler (
             object source,
             System.EventArgs args )
```

Event delegate for the ObjectBreaks EventHandler

Parameters

source	
args	

5.13.3.5 ObjectUnBrokenEventHandler()

```
delegate void SG.SG_Breakable.ObjectUnBrokenEventHandler (
             object source,
             System.EventArgs args )
```

Event delegate for the ObjectUnBreaks EventHandler

Parameters

source	
args	

5.13.3.6 OnObjectBreaks()

```
void SG.SG_Breakable.OnObjectBreaks ( )  [protected]
```

Calls the ObjectBreaks event handler.

5.13.3.7 OnObjectUnBreaks()

```
void SG.SG_Breakable.OnObjectUnBreaks ( )  [protected]
```

Calls the ObjectUnBreaks event handler.

5.13.3.8 ResetObject()

```
virtual void SG.SG_Breakable.ResetObject ( )  [virtual]
```

Reset this objects position and materials.

Reimplemented in SG.SG_BreakableContainer.

5.13.3.9 UnBreak()

```
virtual void SG.SG_Breakable.UnBreak ( ) [virtual]
```

Reset the object to before its unbroken state, at the same location of the current broken object.

Reimplemented in SG.SG_BreakableContainer.

5.13.3.10 WholeMaterial_MaterialBreaks()

```
void SG.SG_Breakable.WholeMaterial_MaterialBreaks (
             object source,
             System.EventArgs args ) [private]
```

Fired when the associated material breaks.

Parameters

source	
args	

5.13.4 Member Data Documentation

5.13.4.1 breakParticles

```
ParticleSystem SG.SG_Breakable.breakParticles
```

Optional Particle System that plays when the object breaks.

5.13.4.2 breakSound

```
AudioSource SG.SG_Breakable.breakSound
```

Optional sound to play when the material breaks.

5.13.4.3 brokenDeform

```
SG_MeshDeform SG.SG_Breakable.brokenDeform [private]
```

(Optional) deform script of the broken object, to reset if the material unbreaks

5.13.4.4 brokenMaterial

```
SG_Material SG.SG_Breakable.brokenMaterial  [private]
```

SenseGlove_Material of the broken object.

5.13.4.5 brokenObject

```
SG_Interactable SG.SG_Breakable.brokenObject
```

The interactable in its broken state.

5.13.4.6 checkTime

```
float SG.SG_Breakable.checkTime = 1.0f
```

The time after which the breakable checks if it needs to reset.

5.13.4.7 resetTime

```
float SG.SG_Breakable.resetTime = 0  [private]
```

Timer to keep track of when this object resets.

5.13.4.8 unbreakMethod

```
UnbreakType SG.SG_Breakable.unbreakMethod = UnbreakType.None
```

Determines if the Breakable resets back to the whole object after the desired timeframe.

5.13.4.9 wholeDeform

```
SG_MeshDeform SG.SG_Breakable.wholeDeform  [private]
```

(Optional) deform script of the whole object, to reset if the material breaks

5.13.4.10 wholeMaterial

`SG_Material SG.SG_Breakable.wholeMaterial [private]`

SenseGlove_Material of the whole object. Used to catch the OnMaterialBreak event.

5.13.4.11 wholeObject

`SG_Interactable SG.SG_Breakable.wholeObject`

The Interactable with a material which can break. Represents the 'whole' object

5.13.5 Event Documentation

5.13.5.1 ObjectBreaks

`ObjectBrokenEventHandler SG.SG_Breakable.ObjectBreaks`

Fires when this objects Break() function has been called.

5.13.5.2 ObjectUnBreaks

`ObjectUnBrokenEventHandler SG.SG_Breakable.ObjectUnBreaks`

Fires when this objects UnBreak() function has been called.

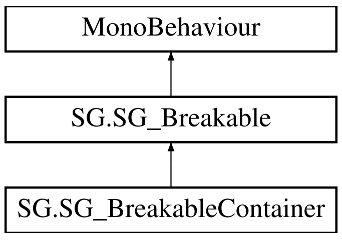
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Interaction/SG_Breakable.↩
  cs

5.14 SG.SG_BreakableContainer Class Reference

A SenseGlove_Breakable that contains objects and optionally spawns shards of itself upon breaking.

Inheritance diagram for SG.SG_BreakableContainer:



Public Member Functions

- override void Break ()

  Called when the breakable material of the wholeObject is broken
- override void UnBreak ()

  Called when the breakable material is reset.
- override void ResetObject ()

  This always resets contents, while Unbreak (called within ResetObjects) does not reset the contents.

Public Attributes

- GameObject shardContainer

  Contains the GameObjects that represent the shards of the broken object.
- GameObject contentsContainer

  Contains SG_Interactable objects that will be released upon the container breaking.
- bool unbreakWithContents = false

  Determines if the contents are placed back into the container when the object is unbroken.

Protected Member Functions

- virtual void **Awake** ()
- void SpawnShards ()

  Spawns the Shards when the container breaks.
- void ResetShards ()

  Put all the shards back to their original (local) transform.
- void SpawnContents ()

  Spawns Contents when the container breaks
- void ResetContents ()

  Resets the contents back to their original (local) transforms.

Static Protected Member Functions

- static void SetRB (GameObject obj, bool gravity, bool kinematic)

  Set the Rigidbody options of a particular gameObject, if the object has any.
- static void SetColliders (GameObject obj, bool trigger)

  Set the Collider options of a particular GameObject, if the object has any.

Protected Attributes

- GameObject[ ] brokenShards = new GameObject[0]

  All GameObjects within the shardsContainer. Will be spawned at the time of breaking.
- SG_Interactable[ ] contents = new SG_Interactable[0]

  All SenseGlove_Interactables within the container. Will be set to interactable at the time of breaking.
- Quaternion[ ] contentRotations

  The localRotations of the shards, applied on a reset.
- Vector3[ ] contentPositions

  The localPositions of the shards, applied on reset.
- Quaternion[ ] shardRotations

  The localRotations of the shards, applied on a reset.
- Vector3[ ] shardPositions

  The localPositions of the shards, applied on reset.

Additional Inherited Members

5.14.1 Detailed Description

A SenseGlove_Breakable that contains objects and optionally spawns shards of itself upon breaking.

5.14.2 Member Function Documentation

5.14.2.1 Break()

```
override void SG.SG_BreakableContainer.Break ( )  [virtual]
```

Called when the breakable material of the wholeObject is broken

Reimplemented from SG.SG_Breakable.

5.14.2.2 ResetContents()

```
void SG.SG_BreakableContainer.ResetContents ( )  [protected]
```

Resets the contents back to their original (local) transforms.

5.14.2.3 ResetObject()

```
override void SG.SG_BreakableContainer.ResetObject ( )  [virtual]
```

This always resets contents, while Unbreak (called within ResetObjects) does not reset the contents.

Reimplemented from SG.SG_Breakable.

5.14.2.4 ResetShards()

```
void SG.SG_BreakableContainer.ResetShards ( )  [protected]
```

Put all the shards back to their original (local) transform.

5.14.2.5 SetColliders()

```
static void SG.SG_BreakableContainer.SetColliders (
             GameObject obj,
             bool trigger )  [static], [protected]
```

Set the Collider options of a particular GameObject, if the object has any.

Parameters

obj	
trigger	

5.14.2.6 SetRB()

```
static void SG.SG_BreakableContainer.SetRB (
             GameObject obj,
             bool gravity,
             bool kinematic )  [static], [protected]
```

Set the Rigidbody options of a particular gameObject, if the object has any.

Parameters

Obj	
gravity	
kinematic	

5.14.2.7 SpawnContents()

```
void SG.SG_BreakableContainer.SpawnContents ( )  [protected]
```

Spawns Contents when the container breaks

The contents have been visible all along, they just havent been active.

5.14.2.8 SpawnShards()

```
void SG.SG_BreakableContainer.SpawnShards ( )  [protected]
```

Spawns the Shards when the container breaks.

5.14.2.9 UnBreak()

```
override void SG.SG_BreakableContainer.UnBreak ( )  [virtual]
```

Called when the breakable material is reset.

Reimplemented from SG.SG_Breakable.

5.14.3 Member Data Documentation

5.14.3.1 brokenShards

```
GameObject [ ] SG.SG_BreakableContainer.brokenShards = new GameObject[0]  [protected]
```

All GameObjects within the shardsContainer. Will be spawned at the time of breaking.

5.14.3.2 contentPositions

```
Vector3 [ ] SG.SG_BreakableContainer.contentPositions  [protected]
```

The localPositions of the shards, applied on reset.

5.14.3.3 contentRotations

```
Quaternion [ ] SG.SG_BreakableContainer.contentRotations  [protected]
```

The localRotations of the shards, applied on a reset.

5.14.3.4 contents

```
SG_Interactable [ ] SG.SG_BreakableContainer.contents = new SG_Interactable[0]  [protected]
```

All SenseGlove_Interactables within the container. Will be set to interactable at the time of breaking.

5.14.3.5 contentsContainer

```
GameObject SG.SG_BreakableContainer.contentsContainer
```

Contains SG_Interactable objects that will be released upon the container breaking.

5.14.3.6 shardContainer

```
GameObject SG.SG_BreakableContainer.shardContainer
```

Contains the GameObjects that represent the shards of the broken object.

5.14.3.7 shardPositions

```
Vector3 [ ] SG.SG_BreakableContainer.shardPositions  [protected]
```

The localPositions of the shards, applied on reset.

5.14.3.8 shardRotations

```
Quaternion [ ] SG.SG_BreakableContainer.shardRotations  [protected]
```

The localRotations of the shards, applied on a reset.

5.14.3.9 unbreakWithContents

```
bool SG.SG_BreakableContainer.unbreakWithContents = false
```

Determines if the contents are placed back into the container when the object is unbroken.

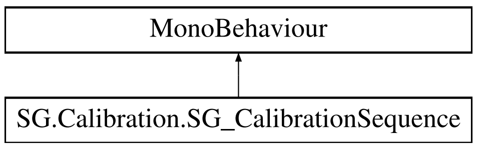
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Interaction/SG_Breakable↩
  Container.cs

5.15 SG.Calibration.SG_CalibrationSequence Class Reference

Manobehaviour meant to run the user though two general calibration steps, and then allows them to refine their calibration

Inheritance diagram for SG.Calibration.SG_CalibrationSequence:



Public Types

- enum CalStage { **AwaitConnection**, **GlobalCalibration**, **LastRefinement**, **Saved** }

  Stage of the Calibration sequence
- enum CalPose {
  FingersExt = 0, **FingersFlexed**, **ThumbUp**, **ThumbFlex**,
  AbdOut, **HandOpen**, **HandClosed**, **NoThumbAbd**,
  All }

  Calibration poses, used to access SG_CalPoses in an array.

Public Member Functions

- Vector3[ ] GetCalibrationValues ()

  Get Calibration Values from the hardware, as the interpolation solver would.
- void CalibratePose (int poseIndex)

  Calibrate the interpolator with a specified pose
- void SaveCalibration ()

  Store calibration on disk so it may be used by other applications.
- void ResetCalibration ()

  Reset Sense Glove Calibration back to its default values.
- void StartGlobal ()

  Start Global Calibration
- void EndGlobal ()

  End global calibration
- void CalibrateCurrentStep ()

  Calibrate the current global calibration step
- void SkipStep ()

  Skip the current calibration step, without calibrating.
- void RegularExit ()

  Allow exiting of the application.
- void SaveAndExit ()

  Save Calibration, then exit the application

Public Attributes

- SG_WireFrame wireFrame

  Wireframe model used to show the glove and access hardware.
- CalStage stage = CalStage.AwaitConnection

  Stage of calibration we are currently in
- int subStage = 0

  Sub-stage of calibration. Used for general calibration.
- Text instrText

  UI element for general instructions.
- GameObject refinementMenu

  Menu containing refinement steps for calibration, which is disabled at start.
- Text generalButtonTxt

  Text of a "Calibrate Current Step" button, that can be altered
- Button skipButton

  Button to skip the current calibration step, only available during general calibration
- Button saveButton

Button to save calibration. Is disabled until changes are detected.
- GameObject endPopup

  Popup to show if there are unsavedChanges
- GameObject openHandEx

  Groups of GameObjects that show example poses of the hand
- KeyCode nextStepKey = KeyCode.Space

  HotKey for calibrating the current global step.
- GameObject[ ] hiddenBeforeStart = new GameObject[0]

  GameObject hidden until the SenseGlove is connected
- GameObject leftAnimation

  HandModels for either a left or right hand, to move along the wireframe
- Transform[ ] rightHands = new Transform[0]

  All GameObjects that represent a right hand, to be mirrored when a left hand is detected.

Protected Member Functions

- void GoToMainStage (int newStage)

  Go to a substage within the Global Calibration

Private Member Functions

- void LoadProfiles (InterpolationSet_IMU intepolator)

  Generates SG_CalibrationPoses for this interpolator.
- void **Start** ()
- void **Update** ()
- void **OnApplicationQuit** ()

Private Attributes

- GameObject **closedHandEx**
- GameObject **rightAnimation**
- bool changes = false

  True if changes are detected, used to check when exiting.
- InterpolationSet_IMU interpolator = null

  Interpolator clone of the Glove, which is updated and applied when calibrating.
- string baseTxt = ""

  Base instruction text to add on top of other instructions
- CalibrationPose[ ] poses = new CalibrationPose[0]

  Calibration poses used to calibate the interpolator

5.15.1 Detailed Description

Manobehaviour meant to run the user though two general calibration steps, and then allows them to refine their calibration

5.15.2 Member Enumeration Documentation

5.15.2.1 CalPose

```
enum SG.Calibration.SG_CalibrationSequence.CalPose  [strong]
```

Calibration poses, used to access SG_CalPoses in an array.

5.15.2.2 CalStage

```
enum SG.Calibration.SG_CalibrationSequence.CalStage  [strong]
```

Stage of the Calibration sequence

5.15.3 Member Function Documentation

5.15.3.1 CalibrateCurrentStep()

```
void SG.Calibration.SG_CalibrationSequence.CalibrateCurrentStep ( )
```

Calibrate the current global calibration step

5.15.3.2 CalibratePose()

```
void SG.Calibration.SG_CalibrationSequence.CalibratePose (
             int poseIndex )
```

Calibrate the interpolator with a specified pose

Parameters

poseIndex	

5.15.3.3 EndGlobal()

```
void SG.Calibration.SG_CalibrationSequence.EndGlobal ( )
```

End global calibration

5.15.3.4 GetCalibrationValues()

```
Vector3 [ ] SG.Calibration.SG_CalibrationSequence.GetCalibrationValues ( )
```

Get Calibration Values from the hardware, as the interpolation solver would.

Returns

5.15.3.5 GoToMainStage()

```
void SG.Calibration.SG_CalibrationSequence.GoToMainStage (
             int newStage )  [protected]
```

Go to a substage within the Global Calibration

Parameters

newStage	

5.15.3.6 LoadProfiles()

```
void SG.Calibration.SG_CalibrationSequence.LoadProfiles (
             InterpolationSet_IMU intepolator )  [private]
```

Generates SG_CalibrationPoses for this interpolator.

Parameters

intepolator	

5.15.3.7 RegularExit()

```
void SG.Calibration.SG_CalibrationSequence.RegularExit ( )
```

Allow exiting of the application.

5.15.3.8 ResetCalibration()

```
void SG.Calibration.SG_CalibrationSequence.ResetCalibration ( )
```

Reset Sense Glove Calibration back to its default values.

5.15.3.9 SaveAndExit()

```
void SG.Calibration.SG_CalibrationSequence.SaveAndExit ( )
```

Save Calibration, then exit the application

5.15.3.10 SaveCalibration()

```
void SG.Calibration.SG_CalibrationSequence.SaveCalibration ( )
```

Store calibration on disk so it may be used by other applications.

5.15.3.11 SkipStep()

```
void SG.Calibration.SG_CalibrationSequence.SkipStep ( )
```

Skip the current calibration step, without calibrating.

5.15.3.12 StartGlobal()

```
void SG.Calibration.SG_CalibrationSequence.StartGlobal ( )
```

Start Global Calibration

5.15.4 Member Data Documentation

5.15.4.1 baseTxt

```
string SG.Calibration.SG_CalibrationSequence.baseTxt = ""  [private]
```

Base instruction text to add on top of other instructions

5.15.4.2 changes

```
bool SG.Calibration.SG_CalibrationSequence.changes = false  [private]
```

True if changes are detected, used to check when exiting.

5.15.4.3 endPopup

```
GameObject SG.Calibration.SG_CalibrationSequence.endPopup
```

Popup to show if there are unsavedChanges

5.15.4.4 generalButtonTxt

```
Text SG.Calibration.SG_CalibrationSequence.generalButtonTxt
```

Text of a "Calibrate Current Step" button, that can be altered

5.15.4.5 hiddenBeforeStart

```
GameObject [] SG.Calibration.SG_CalibrationSequence.hiddenBeforeStart = new GameObject[0]
```

GameObject hidden until the SenseGlove is connected

5.15.4.6 instrText

```
Text SG.Calibration.SG_CalibrationSequence.instrText
```

UI element for general instructions.

5.15.4.7 interpolator

```
InterpolationSet_IMU SG.Calibration.SG_CalibrationSequence.interpolator = null  [private]
```

Interpolator clone of the Glove, which is updated and applied when calibrating.

5.15.4.8 leftAnimation

```
GameObject SG.Calibration.SG_CalibrationSequence.leftAnimation
```

HandModels for either a left or right hand, to move along the wireframe

5.15.4.9 nextStepKey

```
KeyCode SG.Calibration.SG_CalibrationSequence.nextStepKey = KeyCode.Space
```

HotKey for calibrating the current global step.

5.15.4.10 openHandEx

```
GameObject SG.Calibration.SG_CalibrationSequence.openHandEx
```

Groups of GameObjects that show example poses of the hand

5.15.4.11 poses

```
CalibrationPose [] SG.Calibration.SG_CalibrationSequence.poses = new CalibrationPose[0]  [private]
```

Calibration poses used to calibate the interpolator

5.15.4.12 refinementMenu

```
GameObject SG.Calibration.SG_CalibrationSequence.refinementMenu
```

Menu containing refinement steps for calibration, which is disabled at start.

5.15.4.13 rightHands

```
Transform [] SG.Calibration.SG_CalibrationSequence.rightHands = new Transform[0]
```

All GameObjects that represent a right hand, to be mirrored when a left hand is detected.

5.15.4.14 saveButton

```
Button SG.Calibration.SG_CalibrationSequence.saveButton
```

Button to save calibration. Is disabled until changes are detected.

5.15.4.15 skipButton

```
Button SG.Calibration.SG_CalibrationSequence.skipButton
```

Button to skip the current calibration step, only available during general calibration

5.15.4.16 stage

```
CalStage SG.Calibration.SG_CalibrationSequence.stage = CalStage.AwaitConnection
```

Stage of calibration we are currently in

5.15.4.17 subStage

```
int SG.Calibration.SG_CalibrationSequence.subStage = 0
```

Sub-stage of calibration. Used for general calibration.

5.15.4.18 wireFrame

```
SG_WireFrame SG.Calibration.SG_CalibrationSequence.wireFrame
```

Wireframe model used to show the glove and access hardware.

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Calibration/Resources/SG_↩ CalibrationSequence.cs

5.16 SG.Calibration.SG_CalibrationStorage Class Reference

Class responsible for storing and retrieving Sense Glove calibration on disk.

Static Public Member Functions

- static void StoreInterpolation (SenseGloveCs.Kinematics.InterpolationSet_IMU interpolator, SenseGlove↩ Cs.DeviceType type, GloveSide side)

  Stores a deserialized value of an interpolator onto a disk.
- static void StoreInterpolation (string interpolator, SenseGloveCs.DeviceType type, GloveSide side)

  Stores a serialized value of an interpolator onto a disk.
- static bool LoadInterpolation (SenseGloveCs.DeviceType type, GloveSide side, out string output)

  Retrieves an interpolator from the disk. Returns true if one is actually available.

Static Private Member Functions

- static string GetFilename (SenseGloveCs.DeviceType type, GloveSide side)

  Generate a new filename for this calibration profile.

Static Private Attributes

- static readonly string calibrDir

  Default location for storing calibration data.

5.16.1 Detailed Description

Class responsible for storing and retrieving Sense Glove calibration on disk.

5.16.2 Member Function Documentation

5.16.2.1 GetFilename()

```
static string SG.Calibration.SG_CalibrationStorage.GetFilename (
              SenseGloveCs.DeviceType type,
              GloveSide side )  [static], [private]
```

Generate a new filename for this calibration profile.

Parameters

side	

Returns

5.16.2.2 LoadInterpolation()

```
static bool SG.Calibration.SG_CalibrationStorage.LoadInterpolation (
             SenseGloveCs.DeviceType type,
             GloveSide side,
             out string output )  [static]
```

Retrieves an interpolator from the disk. Returns true if one is actually available.

Parameters

side	

Returns

5.16.2.3 StoreInterpolation() [1/2]

```
static void SG.Calibration.SG_CalibrationStorage.StoreInterpolation (
             SenseGloveCs.Kinematics.InterpolationSet_IMU interpolator,
             SenseGloveCs.DeviceType type,
             GloveSide side )  [static]
```

Stores a deserialized value of an interpolator onto a disk.

Parameters

interpolator	
side	

5.16.2.4 StoreInterpolation() [2/2]

```
static void SG.Calibration.SG_CalibrationStorage.StoreInterpolation (
             string interpolator,
             SenseGloveCs.DeviceType type,
             GloveSide side )  [static]
```

Stores a serialized value of an interpolator onto a disk.

Parameters

interpolator	
side	

5.16.3 Member Data Documentation

5.16.3.1 calibrDir

```
readonly string SG.Calibration.SG_CalibrationStorage.calibrDir  [static], [private]
```

Initial value:
```
= System.Environment.GetFolderPath(System.Environment.SpecialFolder.MyDocuments)
            + "/SenseGlove/Calibration/"
```

Default location for storing calibration data.

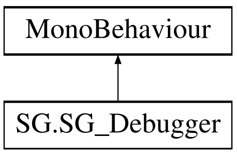
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Calibration/Resources/SG_↩ CalibrationStorage.cs

5.17 SG.SG_Debugger Class Reference

Utility Script that allows access to the internal debugger of the SenseGloveCs Library, and controls debug messages from the SenseGlove SDK specifically.

Inheritance diagram for SG.SG_Debugger:



Static Public Member Functions

- static void Log (string message)

    Write a message to the SG_Debugger.
- static void LogWarning (string message)

    Write a message to the SG_Debugger to appear as a warning.
- static void LogError (string message)

    Write a message to the SG_Debugger to appear as an error.

Public Attributes

- DebugLevel DLL_debugLevel = SenseGloveCs.Diagnostics.Debugger.defaultDebugLvl

    The level of debug messages that one will recieve from the DLL.
- bool unityEnabled = true

    Enables or disables debug messages from the Unity SDK scripts.

Private Member Functions

- void **Awake** ()
- void **LateUpdate** ()
- void **OnDestroy** ()
- void **OnApplicationQuit** ()
- void Instance_DebugMessageRecieved (object source, DebugArgs args)

    Fires when our debugger reports that a new message has been recieved.

Static Private Attributes

- static bool unityEnabled_S = true

    Copies the unityEnabled boolean so it works in a static method.

5.17.1 Detailed Description

Utility Script that allows access to the internal debugger of the SenseGloveCs Library, and controls debug messages from the SenseGlove SDK specifically.

5.17.2 Member Function Documentation

5.17.2.1 Instance_DebugMessageRecieved()

```
void SG.SG_Debugger.Instance_DebugMessageRecieved (
            object source,
            DebugArgs args )  [private]
```

Fires when our debugger reports that a new message has been recieved.

Parameters

source	
args	

5.17.2.2 Log()

```
static void SG.SG_Debugger.Log (
            string message )  [static]
```

Write a message to the SG_Debugger.

Parameters

message	

5.17.2.3 LogError()

```
static void SG.SG_Debugger.LogError (
             string message )  [static]
```

Write a message to the SG_Debugger to appear as an error.

Parameters

message	

5.17.2.4 LogWarning()

```
static void SG.SG_Debugger.LogWarning (
             string message )  [static]
```

Write a message to the SG_Debugger to appear as a warning.

Parameters

message	

5.17.3 Member Data Documentation

5.17.3.1 DLL_debugLevel

```
DebugLevel SG.SG_Debugger.DLL_debugLevel = SenseGloveCs.Diagnostics.Debugger.defaultDebugLvl
```

The level of debug messages that one will recieve from the DLL.

5.17.3.2 unityEnabled

```
bool SG.SG_Debugger.unityEnabled = true
```

Enables or disables debug messages from the Unity SDK scripts.

5.17.3.3 unityEnabled_S

```
bool SG.SG_Debugger.unityEnabled_S = true  [static], [private]
```

Copies the unityEnabled boolean so it works in a static method.

Becomes troublesome if you're using multiple SG_Debugger scripts. Still, I would like to be able to control my debug messages via the inspector.

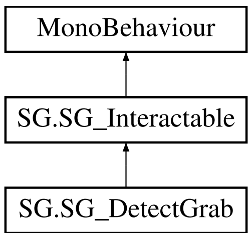
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Util/SG_Debugger.cs

5.18 SG.SG_DetectGrab Class Reference

Attach this to any GameObject with a collider to have SG_Grabscripts detect it. Does not add any manipulation.

Inheritance diagram for SG.SG_DetectGrab:



Protected Member Functions

- override bool InteractionBegin (SG_GrabScript grabScript, bool fromExternal)
  Called when the Interaction begins on this Interactable.
- override bool InteractionEnd (SG_GrabScript grabScript, bool fromExternal)
  Called when the Interaction ends on this Interactable.

Additional Inherited Members

5.18.1 Detailed Description

Attach this to any GameObject with a collider to have SG_Grabscripts detect it. Does not add any manipulation.

5.18.2 Member Function Documentation

5.18.2.1 InteractionBegin()

```
override bool SG.SG_DetectGrab.InteractionBegin (
            SG_GrabScript grabScript,
            bool fromExternal )  [protected], [virtual]
```

Called when the Interaction begins on this Interactable.

Parameters

grabScript	
fromExternal	

Returns

True if a succesfull connection has been established.

Implements SG.SG_Interactable.

5.18.2.2 InteractionEnd()

```
override bool SG.SG_DetectGrab.InteractionEnd (
            SG_GrabScript grabScript,
            bool fromExternal )  [protected], [virtual]
```

Called when the Interaction ends on this Interactable.

Parameters

grabScript	
fromExternal	

Returns

True if the interaction has been ended.

Implements SG.SG_Interactable.

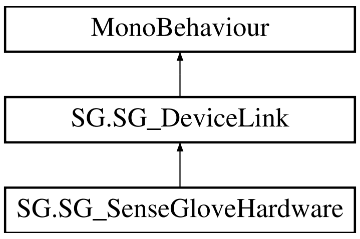
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Interaction/SG_Detect↩ Grab.cs

5.19 SG.SG_DeviceLink Class Reference

Link to a Sense Glove Device.

Inheritance diagram for SG.SG_DeviceLink:



Public Member Functions

- virtual SenseGloveCs.IODevice **GetInternalObject** ()
- bool **LinkDevice** (SenseGloveCs.IODevice device, int index)
- void **UnlinkDevice** ()

Protected Member Functions

- virtual bool **CanLinkTo** (SenseGloveCs.IODevice device)
- virtual void SetupDevice ()

  When linked, this function is run for first time setup.
- virtual void DisposeDevice ()

  Run when the device is unliked, a.k.a. when the DeviceList shuts down / during OnDestroy
- virtual void **OnDestroy** ()

Protected Attributes

- SenseGloveCs.IODevice **linkedDevice** = null

Properties

- int **DeviceIndex** `[get, protected set]`
- virtual bool **IsConnected** `[get]`
- virtual bool **IsLinked** `[get]`

5.19.1 Detailed Description

Link to a Sense Glove Device.

5.19.2 Member Function Documentation

5.19.2.1 DisposeDevice()

```
virtual void SG.SG_DeviceLink.DisposeDevice ( ) [protected], [virtual]
```

Run when the device is unliked, a.k.a. when the DeviceList shuts down / during OnDestroy

Reimplemented in SG.SG_SenseGloveHardware.

5.19.2.2 SetupDevice()

```
virtual void SG.SG_DeviceLink.SetupDevice ( )  [protected], [virtual]
```

When linked, this function is run for first time setup.

Reimplemented in SG.SG_SenseGloveHardware.

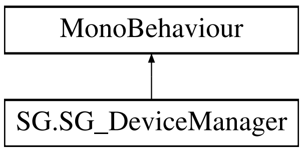
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Devices/SG_DeviceLink.cs

5.20 SG.SG_DeviceManager Class Reference

Class that links SenseGlove hardware to object in the Unity Engine.

Inheritance diagram for SG.SG_DeviceManager:



Classes

- class DeviceDetectedArgs

  Arguments for the GloveDetected Event.

Public Member Functions

- void CheckConnections ()

  Check if any new connections have come in, and should be linked.
- int ListIndex (SG_DeviceLink link)
- void **AddToWatchList** (SG_DeviceLink link)
- void ClearConnections ()

  Clear the current connections to devices so we can try again...

Static Public Member Functions

- static string ReportConnections ()

  Reports all internal connections for debugging purposes.

Public Attributes

- bool **debug** = false
- KeyCode **clearDevicesKey** = KeyCode.None

Protected Member Functions

- void **SetupScanner** ()
- void **DisposeScanner** ()
- void **Log** (string msg)
- void UnlinkAll ()

    Unlink devices from the list so they can be connected again in other scenes.
- void **Start** ()
- void **Update** ()
- void **OnDestroy** ()
- void **OnApplicationQuit** ()

Protected Attributes

- int **lastAvailable** = 0
- List< bool > **linked** = new List<bool>()
- int **objectsLinked** = 0

Private Attributes

- List< SG_DeviceLink > devicesToLink = new List<SG_DeviceLink>()

    Sense Glove related object to link.

5.20.1 Detailed Description

Class that links SenseGlove hardware to object in the Unity Engine.

5.20.2 Member Function Documentation

5.20.2.1 CheckConnections()

```
void SG.SG_DeviceManager.CheckConnections ( )
```

Check if any new connections have come in, and should be linked.

5.20.2.2 ClearConnections()

```
void SG.SG_DeviceManager.ClearConnections ( )
```

Clear the current connections to devices so we can try again...

5.20.2.3 ListIndex()

```
int SG.SG_DeviceManager.ListIndex (
            SG_DeviceLink link )
```

Parameters

link	

Using Index as opposed to bool because it might be useful later on

Returns

5.20.2.4 ReportConnections()

```
static string SG.SG_DeviceManager.ReportConnections ( )  [static]
```

Reports all internal connections for debugging purposes.

Returns

5.20.2.5 UnlinkAll()

```
void SG.SG_DeviceManager.UnlinkAll ( )  [protected]
```

Unlink devices from the list so they can be connected again in other scenes.

5.20.3 Member Data Documentation

5.20.3.1 devicesToLink

```
List<SG_DeviceLink> SG.SG_DeviceManager.devicesToLink = new List<SG_DeviceLink>()  [private]
```

Sense Glove related object to link.

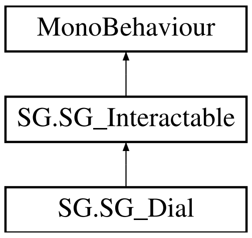
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Devices/SG_Device↩
Manager.cs

5.21 SG.SG_Dial Class Reference

A knob that can be twisted along its axis. Used in intricate button panels.

Inheritance diagram for SG.SG_Dial:



Public Member Functions

- override void UpdateInteraction ()

  Update the dial while it is held by the glove.
- float GetAngle ()

  Retrieve the latest angle of the dial
- float SetAngle (float angle)

  Set the angle of the dial manually. Returns the angle that was set.
- float ValidateAngle (float angle)

  Validate the dial angle before applying it.

Static Public Member Functions

- static Vector3 GetAxis (MovementAxis axis)

  Retrieve a Vector3 representation of this dial's local rotation axis.
- static int AngleIndex (MovementAxis axis)

  Retrieve the index (x, y or z) of the movementAxis.

Public Attributes

- bool useLimits = false

  Whether the dial is limited in a ny direction or not.
- float minAngle = -180

  The minimum angle of the dial, when using limits
- float maxAngle = 180

  The maximum angle of the dial, when using limits

Protected Member Functions

- override bool InteractionBegin (SG_GrabScript grabScript, bool fromExternal=false)

  Start an interaction between this dial and a sense glove.
- override bool InteractionEnd (SG_GrabScript grabScript, bool fromExternal=false)

  End an interaction between this dial and a Sense Glove.
- virtual void UpdateAngle ()

  Contained in a separate method for child classes.
- virtual void **Start** ()
- virtual void **Update** ()

Protected Attributes

- Transform _grabReference

    Grab reference of the grabscript that is currently interacting with this Dial.
- Transform hingePoint

    The point / object around which the object pivots.
- MovementAxis hingeAxis = MovementAxis.X

    The (local) axis of the hingePoint around which this dial pivots.
- Quaternion qBase = Quaternion.identity

    Base rotation at startup, which is considered 0
- Vector3 hinge = new Vector3(1, 0, 0)

    local hinge vector, updated when changing the hingeAxis.
- float currAngle = 0

    The last assigned angle; used for quick access.
- Quaternion rotOffset = Quaternion.identity

    Offset between the grabreference and the hingepoint when the object was touched.
- float anglOffset = 0

    The position of the dial when it was first touched.
- int angleIndex = 0

    Index [x=0. y=1.z=2] by which to access the proper (local) euler angle.

Additional Inherited Members

5.21.1 Detailed Description

A knob that can be twisted along its axis. Used in intricate button panels.

5.21.2 Member Function Documentation

5.21.2.1 AngleIndex()

```
static int SG.SG_Dial.AngleIndex (
            MovementAxis axis )  [static]
```

Retrieve the index (x, y or z) of the movementAxis.

Parameters

axis	

Returns

5.21.2.2 GetAngle()

```
float SG.SG_Dial.GetAngle ( )
```

Retrieve the latest angle of the dial

Returns

5.21.2.3 GetAxis()

```
static Vector3 SG.SG_Dial.GetAxis (
            MovementAxis axis )  [static]
```

Retrieve a Vector3 representation of this dial's local rotation axis.

Parameters

axis	

Returns

5.21.2.4 InteractionBegin()

```
override bool SG.SG_Dial.InteractionBegin (
            SG_GrabScript grabScript,
            bool fromExternal = false )  [protected], [virtual]
```

Start an interaction between this dial and a sense glove.

Parameters

grabScript	
fromExternal	

Implements SG.SG_Interactable.

5.21.2.5 InteractionEnd()

```
override bool SG.SG_Dial.InteractionEnd (
            SG_GrabScript grabScript,
            bool fromExternal = false )  [protected], [virtual]
```

End an interaction between this dial and a Sense Glove.

Parameters

grabScript	
fromExternal	

Implements SG.SG_Interactable.

5.21.2.6 SetAngle()

```
float SG.SG_Dial.SetAngle (
            float angle )
```

Set the angle of the dial manually. Returns the angle that was set.

Parameters

angle	

Returns

5.21.2.7 UpdateAngle()

```
virtual void SG.SG_Dial.UpdateAngle ( )  [protected], [virtual]
```

Contained in a separate method for child classes.

5.21.2.8 UpdateInteraction()

```
override void SG.SG_Dial.UpdateInteraction ( )  [virtual]
```

Update the dial while it is held by the glove.

Reimplemented from SG.SG_Interactable.

5.21.2.9 ValidateAngle()

```
float SG.SG_Dial.ValidateAngle (
            float angle )
```

Validate the dial angle before applying it.

Parameters

angle	

Returns

5.21.3 Member Data Documentation

5.21.3.1 _grabReference

```
Transform SG.SG_Dial._grabReference  [protected]
```

Grab reference of the grabscript that is currently interacting with this Dial.

5.21.3.2 angleIndex

```
int SG.SG_Dial.angleIndex = 0  [protected]
```

Index [x=0. y=1.z=2] by which to access the proper (local) euler angle.

5.21.3.3 anglOffset

```
float SG.SG_Dial.anglOffset = 0  [protected]
```

The position of the dial when it was first touched.

5.21.3.4 currAngle

```
float SG.SG_Dial.currAngle = 0  [protected]
```

The last assigned angle; used for quick access.

5.21.3.5 hinge

```
Vector3 SG.SG_Dial.hinge = new Vector3(1, 0, 0)  [protected]
```

local hinge vector, updated when changing the hingeAxis.

5.21.3.6 hingeAxis

```
MovementAxis SG.SG_Dial.hingeAxis = MovementAxis.X  [protected]
```

The (local) axis of the hingePoint around which this dial pivots.

5.21.3.7 hingePoint

```
Transform SG.SG_Dial.hingePoint  [protected]
```

The point / object around which the object pivots.

5.21.3.8 maxAngle

```
float SG.SG_Dial.maxAngle = 180
```

The maximum angle of the dial, when using limits

5.21.3.9 minAngle

```
float SG.SG_Dial.minAngle = -180
```

The minimum angle of the dial, when using limits

5.21.3.10 qBase

```
Quaternion SG.SG_Dial.qBase = Quaternion.identity  [protected]
```

Base rotation at startup, which is considered 0

5.21.3.11 rotOffset

```
Quaternion SG.SG_Dial.rotOffset = Quaternion.identity [protected]
```

Offset between the grabreference and the hingepoint when the object was touched.

5.21.3.12 useLimits

```
bool SG.SG_Dial.useLimits = false
```

Whether the dial is limited in a ny direction or not.

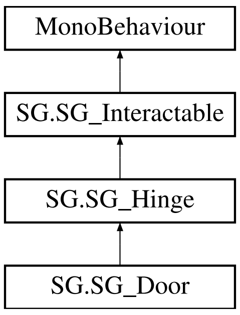
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Interaction/SG_Dial.cs

5.22 SG.SG_Door Class Reference

A SenseGlove_Hinge that represents a door. Can raise opened / closed events and have hidden content.

Inheritance diagram for SG.SG_Door:



Public Member Functions

- delegate void **DoorClosedEventHandler** (object source, EventArgs args)
- delegate void **DoorOpenedEventHandler** (object source, EventArgs args)

Protected Member Functions

- void OnDoorClosed ()

    Raise the DoorClosed event
- void OnDoorOpened ()

    Raise the DoorOpened Event

Events

- DoorClosedEventHandler DoorClosed

    Fires the door returns to its initial position.
- DoorOpenedEventHandler DoorOpened

    Fires the Door returns to its maxLimit position?

Additional Inherited Members

5.22.1 Detailed Description

A SenseGlove_Hinge that represents a door. Can raise opened / closed events and have hidden content.

5.22.2 Member Function Documentation

5.22.2.1 OnDoorClosed()

```
void SG.SG_Door.OnDoorClosed ( )  [protected]
```

Raise the DoorClosed event

5.22.2.2 OnDoorOpened()

```
void SG.SG_Door.OnDoorOpened ( )  [protected]
```

Raise the DoorOpened Event

5.22.3 Event Documentation

5.22.3.1 DoorClosed

```
DoorClosedEventHandler SG.SG_Door.DoorClosed
```

Fires the door returns to its initial position.

5.22.3.2 DoorOpened

```
DoorOpenedEventHandler SG.SG_Door.DoorOpened
```

Fires the Door returns to its maxLimit position?

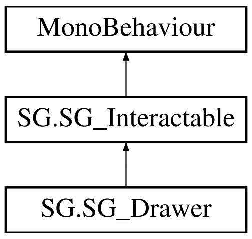
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Interaction/SG_Door.cs

5.23 SG.SG_Drawer Class Reference

A SG_Interactable that moves along one (local) axis.

Inheritance diagram for SG.SG_Drawer:



Public Member Functions

- override void UpdateInteraction ()
  Called when the grabreference of the SG_GrabScript has been updated during the LateUpdate function.
- Vector3 MoveAxis ()
  Retrieve the current movement axis [0, 0, 1].
- void ForceOpen (bool raiseEvent=false)
  Force this drawer to its open (maxDist) position.
- void ForceClosed (bool raiseEvent=false)
  Force this drawer to its original closed (minDist) position
- void SetMoveAxis (MovementAxis newAxis)
  Set the moveDirection of this drawer. This method is cleaner than doing it via the public property
- bool IsOpen ()
  Wheck if this drawer is currently open
- bool IsClosed ()
  Check if this drawer is currently closed.
- override void SaveTransform ()
  Save this drawer's current position when the ResetObject is called.
- override void ResetObject ()
  Reset the drawer (and its contents?) To their original position.
- delegate void **DrawerClosedEventHandler** (object source, EventArgs args)
- delegate void **DrawerOpenedEventHandler** (object source, EventArgs args)
- override void SetInteractable (bool canInteract)
  Sets the object to be interactable (or not).

Public Attributes

- MovementAxis moveDirection = MovementAxis.X

  The movement axis along which the SenseGlove_Drawer slides.
- List< SG_GrabZone > handles = new List<SG_GrabZone>()

  The handles connected to this drawer.
- float minDrawerDist = 0

  The minimum distance that this drawer can move from its starting position.
- float maxDrawerDist = 1

  The maximum distance that this drawer can move from its starting position.

Protected Member Functions

- virtual void **Awake** ()
- virtual void **Start** ()
- virtual void **Update** ()
- override bool InteractionBegin (SG_GrabScript grabScript, bool fromExternal=false)

  Called when a new SG_GrabScript engages in an interaction with this Drawer
- override bool InteractionEnd (SG_GrabScript grabScript, bool fromExternal=false)

  Called when a SG_GrabScript ends the interaction with this drawer.
- void **OnDrawerClosed** ()
- void **OnDrawerOpened** ()

Properties

- Vector3 **InitPos** `[get]`
- float **DrawerRatio** `[get]`

Events

- DrawerClosedEventHandler DrawerClosed

  Fires the Drawer returns to its initial position.
- DrawerOpenedEventHandler DrawerOpened

  Fires when the drawer reached its maximum extension.

Private Attributes

- bool openEventFired = false

  Used to ensure the open and closed events are not fired every time.
- bool **closeEventFired** = true
- GameObject grabReference

  The Grabreference of the SG_GrabScript that is attached to this drawer.
- Vector3 grabOffset = Vector3.zero

  The offset between the grabReference at the time this drawer's interaction began.
- Vector3 moveAxis

  The movement axis of this drawer. Will always be normalized (size is 1)
- MovementAxis actualMoveDirection = MovementAxis.X

  Automatically recalculates the MoveAxis when one changes the moveDirection via the public property.

Additional Inherited Members

5.23.1 Detailed Description

A SG_Interactable that moves along one (local) axis.

5.23.2 Member Function Documentation

5.23.2.1 ForceClosed()

```
void SG.SG_Drawer.ForceClosed (
             bool raiseEvent = false )
```

Force this drawer to its original closed (minDist) position

5.23.2.2 ForceOpen()

```
void SG.SG_Drawer.ForceOpen (
             bool raiseEvent = false )
```

Force this drawer to its open (maxDist) position.

5.23.2.3 InteractionBegin()

```
override bool SG.SG_Drawer.InteractionBegin (
             SG_GrabScript grabScript,
             bool fromExternal = false )  [protected], [virtual]
```

Called when a new SG_GrabScript engages in an interaction with this Drawer

Parameters

grabScript	
fromExternal	

Implements SG.SG_Interactable.

5.23.2.4 InteractionEnd()

```
override bool SG.SG_Drawer.InteractionEnd (
            SG_GrabScript grabScript,
            bool fromExternal = false )  [protected], [virtual]
```

Called when a SG_GrabScript ends the interaction with this drawer.

Parameters

grabScript	
fromExternal	

Implements SG.SG_Interactable.

5.23.2.5 IsClosed()

```
bool SG.SG_Drawer.IsClosed ( )
```

Check if this drawer is currently closed.

Returns

5.23.2.6 IsOpen()

```
bool SG.SG_Drawer.IsOpen ( )
```

Wheck if this drawer is currently open

Returns

5.23.2.7 MoveAxis()

```
Vector3 SG.SG_Drawer.MoveAxis ( )
```

Retrieve the current movement axis [0, 0, 1].

Returns

5.23.2.8 ResetObject()

```
override void SG.SG_Drawer.ResetObject ( )  [virtual]
```

Reset the drawer (and its contents?) To their original position.

Reimplemented from SG.SG_Interactable.

5.23.2.9 SaveTransform()

```
override void SG.SG_Drawer.SaveTransform ( )  [virtual]
```

Save this drawer's current position when the ResetObject is called.

Reimplemented from SG.SG_Interactable.

5.23.2.10 SetInteractable()

```
override void SG.SG_Drawer.SetInteractable (
             bool canInteract )  [virtual]
```

Sets the object to be interactable (or not).

May be overridden by sub-classes.

Parameters

canInteract	

Reimplemented from SG.SG_Interactable.

5.23.2.11 SetMoveAxis()

```
void SG.SG_Drawer.SetMoveAxis (
             MovementAxis newAxis )
```

Set the moveDirection of this drawer. This method is cleaner than doing it via the public property

Parameters

newAxis	

5.23.2.12 UpdateInteraction()

```
override void SG.SG_Drawer.UpdateInteraction ( )  [virtual]
```

Called when the grabreference of the SG_GrabScript has been updated during the LateUpdate function.

Reimplemented from SG.SG_Interactable.

5.23.3 Member Data Documentation

5.23.3.1 actualMoveDirection

```
MovementAxis SG.SG_Drawer.actualMoveDirection = MovementAxis.X  [private]
```

Automatically recalculates the MoveAxis when one changes the moveDirection via the public property.

5.23.3.2 grabOffset

```
Vector3 SG.SG_Drawer.grabOffset = Vector3.zero  [private]
```

The offset between the grabReference at the time this drawer's interaction began.

5.23.3.3 grabReference

```
GameObject SG.SG_Drawer.grabReference  [private]
```

The Grabreference of the SG_GrabScript that is attached to this drawer.

5.23.3.4 handles

```
List<SG_GrabZone> SG.SG_Drawer.handles = new List<SG_GrabZone>()
```

The handles connected to this drawer.

5.23.3.5 maxDrawerDist

```
float SG.SG_Drawer.maxDrawerDist = 1
```

The maximum distance that this drawer can move from its starting position.

5.23.3.6 minDrawerDist

```
float SG.SG_Drawer.minDrawerDist = 0
```

The minimum distance that this drawer can move from its starting position.

5.23.3.7 moveAxis

```
Vector3 SG.SG_Drawer.moveAxis  [private]
```

The movement axis of this drawer. Will always be normalized (size is 1)

5.23.3.8 moveDirection

```
MovementAxis SG.SG_Drawer.moveDirection = MovementAxis.X
```

The movement axis along which the SenseGlove_Drawer slides.

5.23.3.9 openEventFired

```
bool SG.SG_Drawer.openEventFired = false  [private]
```

Used to ensure the open and closed events are not fired every time.

5.23.4 Event Documentation

5.23.4.1 DrawerClosed

```
DrawerClosedEventHandler SG.SG_Drawer.DrawerClosed
```

Fires the Drawer returns to its initial position.

5.23.4.2 DrawerOpened

```
DrawerOpenedEventHandler SG.SG_Drawer.DrawerOpened
```

Fires when the drawer reached its maximum extension.

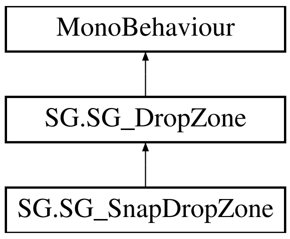
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Interaction/SG_Drawer.cs

5.24 SG.SG_DropZone Class Reference

Detects SenseGlove_Grabables within its volume.

Inheritance diagram for SG.SG_DropZone:



Classes

- class DropProps
  Properties that assist in object detection.
- class DropZoneArgs

Public Member Functions

- virtual void ValidateSettings ()
  Validates the settings of this DropZone.
- bool IsDetected (SG_Grabable obj)
  Check if this Object has already been detected.
- bool IsTarget (SG_Grabable obj)
  Check if this SG_SenseGloveHardware is one of the "goal" objects;
- void AddTarget (SG_Grabable obj)
  Add a target object.
- virtual void AddObject (SG_Grabable grabable)
  Adds an object to this SenseGlove_DropZone. Does not fire the eventTime.
- virtual void RemoveObject (SG_Grabable grabable)
  Removes a specific object from this SenseGlove_DropZone
- virtual void ClearObjects ()
  Clear all objects currently detected within this space.
- void SetHighLight (bool active)
  Turn the Highlighter(s) of this DropZone on or off.
- virtual void ResetZoneAndObjects ()
  Resets both the zone and its objects to their original state.
- delegate void DropZoneEventHandler (object source, DropZoneArgs args)
  Event Delegate for DropZones.

Static Public Member Functions

- static int ListIndex (SG_Grabable obj, List< SG_Grabable > grabables)

  Retrieve the index of a Grabable within a list of Grabables.

Public Attributes

- List< SG_Grabable > objectsToGet = new List<SG_Grabable>()

  The objects that should be inside this DropZone. Leave it empty to snap to all SenseGlove_Grabables.
- float detectionTime = 0.2f

  The time (in s) that a Grabable must be inside this zone before it is considered 'inside'.
- bool detectHeldObjects = true

  Determines if objects that are still being held are detected.
- MeshRenderer[ ] highLighters

  An optional highlight for this snapzone that can be turned on or off.

Protected Member Functions

- void ValidateRB ()

  Check if all RigidBody settings allow us to pick up objects.
- virtual void RemoveObject (int index)

  Raises a removed event and then remove an object from all associated lists
- virtual void CheckObjectEnter (GameObject obj)

  Check if a newly incoming object belongs to our targets.
- virtual void **CheckObjectExit** (GameObject obj)
- virtual void CheckDetectionTimes ()

  Checks Detection times of the Grabables within this zone.
- virtual void CallObjectDetect (SG_Grabable detectedObject)

  Calls the ObjectDetected event
- virtual void CallObjectRemoved (SG_Grabable removedObject)

  Calls the ObjectRemoved event
- virtual void **Update** ()
- virtual void **OnDestroy** ()
- virtual void **OnEnable** ()
- virtual void **OnTriggerEnter** (Collider other)
- virtual void **OnTriggerStay** (Collider other)
- virtual void **OnTriggerExit** (Collider other)

Protected Attributes

- SGEvent OnObjectDetected

  Fires when an Object is Detected.
- SGEvent OnObjectRemoved

  Fires when an Object is Removed.
- bool setup = false

  Whether ot not this script has run setup before.
- float checkStayTimer = 0

  Timer variable to check OnCollisionStay.
- Rigidbody physicsBody

  The RigidBody connected to this DropZone.
- List< SG_Grabable > objectsInside = new List<SG_Grabable>()

  The list of objects currently inside this dropZone
- List< DropProps > dropProperties = new List<DropProps>()

  Contains all properties for dropZone logic.

Static Protected Attributes

- static float checkStayTime = 0.2f

    The time, in seconds, for which to check OnCollisionStay

Properties

- SG_Grabable[ ] ObjectsInside `[get]`

    Get a list of all objects inside this DropZone.
- SG_Grabable[ ] **TargetObjects** `[get]`
- int NumberOfObjects `[get]`

    Check the amount of objects within this DropZone.
- bool AllObjectsDetected `[get]`

    Check if all desired objects have been detected.

Events

- DropZoneEventHandler ObjectDetected

    Fires when an object has been detected inside this dropZone.
- DropZoneEventHandler ObjectRemoved

    Fires when an object has been removed from this dropZone.

5.24.1 Detailed Description

Detects SenseGlove_Grabables within its volume.

5.24.2 Member Function Documentation

5.24.2.1 AddObject()

```
virtual void SG.SG_DropZone.AddObject (
            SG_Grabable grabable )  [virtual]
```

Adds an object to this SenseGlove_DropZone. Does not fire the eventTime.

Parameters

grabable	

Reimplemented in SG.SG_SnapDropZone.

5.24.2.2 AddTarget()

```
void SG.SG_DropZone.AddTarget (
            SG_Grabable obj )
```

Add a target object.

Parameters

obj	

5.24.2.3 CallObjectDetect()

```
virtual void SG.SG_DropZone.CallObjectDetect (
            SG_Grabable detectedObject )  [protected], [virtual]
```

Calls the ObjectDetected event

Parameters

detectedObject	

Reimplemented in SG.SG_SnapDropZone.

5.24.2.4 CallObjectRemoved()

```
virtual void SG.SG_DropZone.CallObjectRemoved (
            SG_Grabable removedObject )  [protected], [virtual]
```

Calls the ObjectRemoved event

Parameters

removedObject	

5.24.2.5 CheckDetectionTimes()

```
virtual void SG.SG_DropZone.CheckDetectionTimes ( )  [protected], [virtual]
```

Checks Detection times of the Grabables within this zone.

5.24.2.6 CheckObjectEnter()

```
virtual void SG.SG_DropZone.CheckObjectEnter (
             GameObject obj )  [protected], [virtual]
```

Check if a newly incoming object belongs to our targets.

Parameters

obj	

5.24.2.7 ClearObjects()

```
virtual void SG.SG_DropZone.ClearObjects ( )  [virtual]
```

Clear all objects currently detected within this space.

5.24.2.8 DropZoneEventHandler()

```
delegate void SG.SG_DropZone.DropZoneEventHandler (
             object source,
             DropZoneArgs args )
```

Event Delegate for DropZones.

Parameters

source	
args	

5.24.2.9 IsDetected()

```
bool SG.SG_DropZone.IsDetected (
             SG_Grabable obj )
```

Check if this Object has already been detected.

Parameters

obj	

Returns

5.24.2.10 IsTarget()

```
bool SG.SG_DropZone.IsTarget (
             SG_Grabable obj )
```

Check if this SG_SenseGloveHardware is one of the "goal" objects;

Parameters

obj	

Returns

5.24.2.11 ListIndex()

```
static int SG.SG_DropZone.ListIndex (
             SG_Grabable obj,
             List< SG_Grabable > grabables )  [static]
```

Retrieve the index of a Grabable within a list of Grabables.

Parameters

obj	
grabables	

Returns

Returns -1 if obj does not exist in grabables.

5.24.2.12 RemoveObject() [1/2]

```
virtual void SG.SG_DropZone.RemoveObject (
             int index )  [protected], [virtual]
```

Raises a removed event and then remove an object from all associated lists

Parameters

index	

Reimplemented in SG.SG_SnapDropZone.

5.24.2.13 RemoveObject() [2/2]

```
virtual void SG.SG_DropZone.RemoveObject (
            SG_Grabable grabable )  [virtual]
```

Removes a specific object from this SenseGlove_DropZone

Parameters

grabable	

5.24.2.14 ResetZoneAndObjects()

```
virtual void SG.SG_DropZone.ResetZoneAndObjects ( )  [virtual]
```

Resets both the zone and its objects to their original state.

5.24.2.15 SetHighLight()

```
void SG.SG_DropZone.SetHighLight (
            bool active )
```

Turn the Highlighter(s) of this DropZone on or off.

Parameters

active	

5.24.2.16 ValidateRB()

```
void SG.SG_DropZone.ValidateRB ( )  [protected]
```

Check if all RigidBody settings allow us to pick up objects.

5.24.2.17 ValidateSettings()

```
virtual void SG.SG_DropZone.ValidateSettings ( )  [virtual]
```

Validates the settings of this DropZone.

Reimplemented in SG.SG_SnapDropZone.

5.24.3 Member Data Documentation

5.24.3.1 checkStayTime

```
float SG.SG_DropZone.checkStayTime = 0.2f  [static], [protected]
```

The time, in seconds, for which to check OnCollisionStay

In case the collider is enabled with an object already inside

5.24.3.2 checkStayTimer

```
float SG.SG_DropZone.checkStayTimer = 0  [protected]
```

Timer variable to check OnCollisionStay.

5.24.3.3 detectHeldObjects

```
bool SG.SG_DropZone.detectHeldObjects = true
```

Determines if objects that are still being held are detected.

5.24.3.4 detectionTime

```
float SG.SG_DropZone.detectionTime = 0.2f
```

The time (in s) that a Grabable must be inside this zone before it is considered 'inside'.

5.24.3.5 dropProperties

```
List<DropProps> SG.SG_DropZone.dropProperties = new List<DropProps>()  [protected]
```

Contains all properties for dropZone logic.

5.24.3.6 highLighters

```
MeshRenderer [] SG.SG_DropZone.highLighters
```

An optional highlight for this snapzone that can be turned on or off.

5.24.3.7 objectsInside

```
List<SG_Grabable> SG.SG_DropZone.objectsInside = new List<SG_Grabable>()  [protected]
```

The list of objects currently inside this dropZone

5.24.3.8 objectsToGet

```
List<SG_Grabable> SG.SG_DropZone.objectsToGet = new List<SG_Grabable>()
```

The objects that should be inside this DropZone. Leave it empty to snap to all SenseGlove_Grabables.

5.24.3.9 OnObjectDetected

```
SGEvent SG.SG_DropZone.OnObjectDetected  [protected]
```

Fires when an Object is Detected.

5.24.3.10 OnObjectRemoved

```
SGEvent SG.SG_DropZone.OnObjectRemoved  [protected]
```

Fires when an Object is Removed.

5.24.3.11 physicsBody

```
Rigidbody SG.SG_DropZone.physicsBody  [protected]
```

The RigidBody connected to this DropZone.

5.24.3.12 setup

```
bool SG.SG_DropZone.setup = false  [protected]
```

Whether ot not this script has run setup before.

5.24.4 Property Documentation

5.24.4.1 AllObjectsDetected

```
bool SG.SG_DropZone.AllObjectsDetected  [get]
```

Check if all desired objects have been detected.

Returns

5.24.4.2 NumberOfObjects

```
int SG.SG_DropZone.NumberOfObjects  [get]
```

Check the amount of objects within this DropZone.

Returns

5.24.4.3 ObjectsInside

```
SG_Grabable [] SG.SG_DropZone.ObjectsInside  [get]
```

Get a list of all objects inside this DropZone.

Returns

5.24.5 Event Documentation

5.24.5.1 ObjectDetected

`DropZoneEventHandler SG.SG_DropZone.ObjectDetected`

Fires when an object has been detected inside this dropZone.

5.24.5.2 ObjectRemoved

`DropZoneEventHandler SG.SG_DropZone.ObjectRemoved`

Fires when an object has been removed from this dropZone.

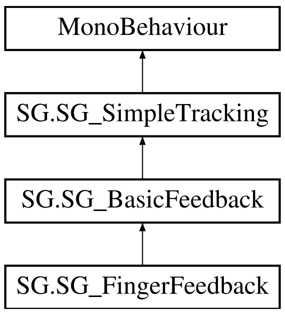
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Controls/SG_DropZone.cs

5.25 SG.SG_FingerFeedback Class Reference

Extends impact feedback to also take into account force feedback from SG_Material's. These scripts calculate their distance into a collider.

Inheritance diagram for SG.SG_FingerFeedback:



Public Member Functions

- void ResetForces ()
  Reset the forces and distances
- override void SetupSelf ()
  Setup this collider's properties
- bool IsTouching ()
  Check if this collider is touching a valid GameObject
- bool IsTouching (GameObject obj)
  Check if this script is touching a specific gameobject
- bool IsTouching (Collider collider)
  Check if this collider is touching a specific collider
- void DetachScript ()
  Remove this script's reference to its SG_Material so that it is free to find another

Static Public Member Functions

- static bool GetMaterialScript (Collider col, out SG_Material materialScript, bool favourSpecific=true)

  Utility function to find a SG_Material script attached to a collider. Returns true if such a script exists.
- static bool SameScript (Collider col, SG_Material touchedMat)

  Utility function to check if a collider has a specific SG_Material collider attached.

Public Attributes

- bool debugDirections = false

  If true, the force vectors of this script are rendered into the Scene view.

Protected Member Functions

- bool ObjectDisabled ()

  Returns true if this script's touchedObject has been disabled or destroyed.
- void FindForceDirection (Collider col)

  Calculated an 'entry vector' between this object and a collider.
- void AttachScript (Collider collider, SG_Material material)

  Connect this script to a SG_Material, and link any other possible components
- override void **FixedUpdate** ()
- override void **OnTriggerEnter** (Collider other)
- virtual void **OnTriggerExit** (Collider other)

Protected Attributes

- Vector3 entryOrigin = Vector3.zero

  The position of the collider the moment it entered a new object. Used to determine collider normal.
- Vector3 entryPoint = Vector3.zero

  A point of the collider of the touchedObject on the moment that collision was detected. Used to determine collider normal.

Properties

- GameObject TouchedObject `[get, protected set]`

  The object that is currently touched by this SenseGlove_Touch script.
- SG_Material TouchedMaterialScript `[get, protected set]`

  The Material of the last touched object. If set to null, it may have been deleted.
- SG_MeshDeform TouchedDeformScript `[get, protected set]`

  The Mesh Deform of the last touched object, if available. Used to deform an object based on its SenseGlove-Material Properties.
- Collider TouchedCollider `[get, protected set]`

  The collider that activated the feedback
- float DistanceInCollider `[get, protected set]`

  The distance [in m] that the finger collider has penetrated into the object.
- int ForceLevel `[get, protected set]`

  The current force-feedback level as determined by the material properties of the object we are touching.

Private Member Functions

- void UpdateFeedback ()

    Calculate the force feedback levels based on material properties.

Additional Inherited Members

5.25.1 Detailed Description

Extends impact feedback to also take into account force feedback from SG_Material's. These scripts calculate their distance into a collider.

5.25.2 Member Function Documentation

5.25.2.1 AttachScript()

```
void SG.SG_FingerFeedback.AttachScript (
            Collider collider,
            SG_Material material )  [protected]
```

Connect this script to a SG_Material, and link any other possible components

Parameters

collider	
material	

5.25.2.2 DetachScript()

```
void SG.SG_FingerFeedback.DetachScript ( )
```

Remove this script's reference to its SG_Material so that it is free to find another

5.25.2.3 FindForceDirection()

```
void SG.SG_FingerFeedback.FindForceDirection (
            Collider col )  [protected]
```

Calculated an 'entry vector' between this object and a collider.

Parameters

col	

5.25.2.4 GetMaterialScript()

```
static bool SG.SG_FingerFeedback.GetMaterialScript (
             Collider col,
             out SG_Material materialScript,
             bool favourSpecific = true )  [static]
```

Utility function to find a SG_Material script attached to a collider. Returns true if such a script exists.

Parameters

col	
materialScript	
favourSpecific	

Returns

5.25.2.5 IsTouching() [1/3]

```
bool SG.SG_FingerFeedback.IsTouching ( )
```

Check if this collider is touching a valid GameObject

5.25.2.6 IsTouching() [2/3]

```
bool SG.SG_FingerFeedback.IsTouching (
             Collider collider )
```

Check if this collider is touching a specific collider

Parameters

collider	

Returns

5.25.2.7 IsTouching() [3/3]

```
bool SG.SG_FingerFeedback.IsTouching (
             GameObject obj )
```

Check if this script is touching a specific gameobject

Parameters

obj	

Returns

5.25.2.8 ObjectDisabled()

```
bool SG.SG_FingerFeedback.ObjectDisabled ( )  [protected]
```

Returns true if this script's touchedObject has been disabled or destroyed.

Returns

5.25.2.9 ResetForces()

```
void SG.SG_FingerFeedback.ResetForces ( )
```

Reset the forces and distances

5.25.2.10 SameScript()

```
static bool SG.SG_FingerFeedback.SameScript (
             Collider col,
             SG_Material touchedMat )  [static]
```

Utility function to check if a collider has a specific SG_Material collider attached.

Parameters

col	
touchedMat	

Returns

5.25.2.11 SetupSelf()

```
override void SG.SG_FingerFeedback.SetupSelf ( )  [virtual]
```

Setup this collider's properties

Reimplemented from SG.SG_BasicFeedback.

5.25.2.12 UpdateFeedback()

```
void SG.SG_FingerFeedback.UpdateFeedback ( )  [private]
```

Calculate the force feedback levels based on material properties.

5.25.3 Member Data Documentation

5.25.3.1 debugDirections

```
bool SG.SG_FingerFeedback.debugDirections = false
```

If true, the force vectors of this script are rendered into the Scene view.

5.25.3.2 entryOrigin

```
Vector3 SG.SG_FingerFeedback.entryOrigin = Vector3.zero  [protected]
```

The position of the collider the moment it entered a new object. Used to determine collider normal.

5.25.3.3 entryPoint

`Vector3 SG.SG_FingerFeedback.entryPoint = Vector3.zero [protected]`

A point of the collider of the touchedObject on the moment that collision was detected. Used to determine collider normal.

5.25.4 Property Documentation

5.25.4.1 DistanceInCollider

`float SG.SG_FingerFeedback.DistanceInCollider [get], [protected set]`

The distance [in m] that the finger collider has penetrated into the object.

5.25.4.2 ForceLevel

`int SG.SG_FingerFeedback.ForceLevel [get], [protected set]`

The current force-feedback level as determined by the material properties of the object we are touching.

5.25.4.3 TouchedCollider

`Collider SG.SG_FingerFeedback.TouchedCollider [get], [protected set]`

The collider that activated the feedback

5.25.4.4 TouchedDeformScript

`SG_MeshDeform SG.SG_FingerFeedback.TouchedDeformScript [get], [protected set]`

The Mesh Deform of the last touched object, if available. Used to deform an object based on its SenseGlove-↩ Material Properties.

5.25.4.5 TouchedMaterialScript

```
SG_Material SG.SG_FingerFeedback.TouchedMaterialScript  [get], [protected set]
```

The Material of the last touched object. If set to null, it may have been deleted.

5.25.4.6 TouchedObject

```
GameObject SG.SG_FingerFeedback.TouchedObject  [get], [protected set]
```

The object that is currently touched by this SenseGlove_Touch script.

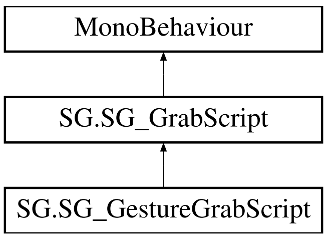
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Feedback/SG_Finger↩
  Feedback.cs

5.26 SG.SG_GestureGrabScript Class Reference

A simplified SenseGlove_GrabScript that grabs all objects within it's 'hover collider' when a grab gestire is made.

Inheritance diagram for SG.SG_GestureGrabScript:



Public Member Functions

- override bool CanInteract ()

  Returns true if this GrabScript is all set up to go.
- override bool IsTouching ()

  Returns tru if our HoverCollider is hovering above a valid object
- override bool Setup ()

  Setup this GrabScript's components.
- override void UpdateGrabScript ()

  Update this GrabScript's behaviour.

Public Attributes

- SG_HoverCollider hoverCollider

  A collider in the hand palm that checks for SenseGlove_Interactable objects near the hand.

Protected Attributes

- float[ ] lastAngles = new float[5]

  Angles during the last update, used to check for grab/release events.
- bool[ ] grabbing = new bool[5]

  Whether each finger can be considered to be 'grasping' or ;grabbing'
- bool wantedGrab = false

  Whether a grab action was desired during the last frame.

Static Protected Attributes

- static float[ ] baseGrabAngles = new float[5] { -60, -45, -45, -45, -90 }

  Total flexion must fall below these values to consider 'grabbing'. Sorted thumb to pinky
- static float[ ] baseReleaseAngles = new float[5] { -20, -20, -20, -20, -45 }

  Total flexion must fall below these values to consider 'releasing'. Sorted thumb to pinky

Additional Inherited Members

5.26.1 Detailed Description

A simplified SenseGlove_GrabScript that grabs all objects within it's 'hover collider' when a grab gestire is made.

5.26.2 Member Function Documentation

5.26.2.1 CanInteract()

```
override bool SG.SG_GestureGrabScript.CanInteract ( )  [virtual]
```

Returns true if this GrabScript is all set up to go.

Returns

Implements SG.SG_GrabScript.

5.26.2.2 IsTouching()

```
override bool SG.SG_GestureGrabScript.IsTouching ( )  [virtual]
```

Returns tru if our HoverCollider is hovering above a valid object

Returns

Implements SG.SG_GrabScript.

5.26.2.3 Setup()

```
override bool SG.SG_GestureGrabScript.Setup ( )  [virtual]
```

Setup this GrabScript's components.

Returns

Implements SG.SG_GrabScript.

5.26.2.4 UpdateGrabScript()

```
override void SG.SG_GestureGrabScript.UpdateGrabScript ( )  [virtual]
```

Update this GrabScript's behaviour.

Implements SG.SG_GrabScript.

5.26.3 Member Data Documentation

5.26.3.1 baseGrabAngles

```
float [] SG.SG_GestureGrabScript.baseGrabAngles = new float[5] { -60, -45, -45, -45, -90 }
[static], [protected]
```

Total flexion must fall below these values to consider 'grabbing'. Sorted thumb to pinky

5.26.3.2 baseReleaseAngles

```
float [] SG.SG_GestureGrabScript.baseReleaseAngles = new float[5] { -20, -20, -20, -20, -45 }
[static], [protected]
```

Total flexion must fall below these values to consider 'releasing'. Sorted thumb to pinky

5.26.3.3 grabbing

```
bool [] SG.SG_GestureGrabScript.grabbing = new bool[5]  [protected]
```

Whether each finger can be considered to be 'grasping' or ;grabbing'

5.26.3.4 hoverCollider

`SG_HoverCollider SG.SG_GestureGrabScript.hoverCollider`

A collider in the hand palm that checks for SenseGlove_Interactable objects near the hand.

5.26.3.5 lastAngles

`float [ ] SG.SG_GestureGrabScript.lastAngles = new float[5]  [protected]`

Angles during the last update, used to check for grab/release events.

5.26.3.6 wantedGrab

`bool SG.SG_GestureGrabScript.wantedGrab = false  [protected]`

Whether a grab action was desired during the last frame.

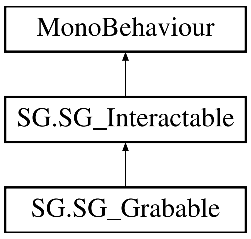
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Grabbing/SG_Gesture↩ GrabScript.cs

5.27 SG.SG_Grabable Class Reference

An object that can be picked up and dropped by the SenseGlove.

Inheritance diagram for SG.SG_Grabable:



Public Member Functions

- override void UpdateInteraction ()

  Called when this object is being held and the GrabReference is updated.
- void SnapMeTo (Transform originToMatch)

  Moves this Grbabale such that its snapRefrence matches the rotation and position of the originToMatch.
- override void SaveTransform ()

  Save this object's position and orientation, in case the ResetObject function is called.
- override void ResetObject ()

  Reset this object back to its original position. Removes all connections between this and grabscripts.
- bool IsGrabbed ()

  Check if this Interactable is currently being held by a SenseGlove GrabScript.
- void ZeroVelocity ()

  Set the Velocities of this script to 0. Stops the grabable from rotating / flying away.
- bool ConnectJoint (Rigidbody other, float breakForce=SG_Grabable.defaultBreakForce)

  Connect this Grabable's rigidBody to another using a FixedJoint
- void BreakJoint ()

  Remove a fixedJoint connection between this object and another.
- void SetCollision (bool active)

  Enable/Disable rigidbody collision of this Grabable.
- virtual void CheckPickupRef ()

  Check the PickupReference of this Grabable
- virtual void SaveRBParameters ()

  Store the RigidBody parameters of this Grabable
- virtual void **Awake** ()

Public Attributes

- GrabType pickupMethod = GrabType.Parent

  The way that this object is be picked up by a GrabScript.
- AttachType attachMethod = AttachType.Default

  The way this object connects itself to the grabscript.
- Transform snapReference

  If this object has an attachType of SnapToAnchor, this transform is used as a refrence.
- bool canTransfer = true

  Whether or not this object can be picked up by another Grabscript while it is being held.
- Transform pickupReference

  The transform that is grabbed instead of this object. Useful when dealing with a grabable that is a child of another grabable.
- Rigidbody physicsBody

  The rigidBody to which velocity, gravity and kinematic options are applied.

Static Public Attributes

- const float **defaultBreakForce** = 4000

Protected Member Functions

- override bool InteractionBegin (SG_GrabScript grabScript, bool fromExternal=false)

  Called when a SG_GrabScript initiates an interaction with this grabable.
- override bool InteractionEnd (SG_GrabScript grabScript, bool fromExternal=false)

  Called when a SG_GrabScript no longer wishes to interact with this grabable.
- virtual void **Update** ()

Protected Attributes

- GameObject grabReference

  The gameObject used as a reference for the Grabable's transform updates.
- Vector3 grabOffset = Vector3.zero

  The xyz offset of this Grabable's transform to the grabReference, on the moment it was picked up.
- Quaternion grabRotation = Quaternion.identity

  The quaternion offset of this Grabable's transform to the grabReference, on the moment it was picked up.
- Transform **originalParent**
- Joint **connection**
- bool wasKinematic

  Whether this grabable's physicsBody was kinematic before it was picked up.
- bool usedGravity

  Whether this grabable's physicsBody was used gravity before it was picked up.

Properties

- Transform OriginalParent `[get, set]`

  The original parent of this Grabable, before any GrabScripts picked it up.
- bool UsedGravity `[get, set]`

  Whether this Grabable used gravity before it was picked up
- bool WasKinematic `[get, set]`

  Whether this Grabable was marked as Kinematic before it was picked up

Additional Inherited Members

5.27.1 Detailed Description

An object that can be picked up and dropped by the SenseGlove.

5.27.2 Member Function Documentation

5.27.2.1 BreakJoint()

```
void SG.SG_Grabable.BreakJoint ( )
```

Remove a fixedJoint connection between this object and another.

5.27.2.2 CheckPickupRef()

```
virtual void SG.SG_Grabable.CheckPickupRef ( )  [virtual]
```

Check the PickupReference of this Grabable

5.27.2.3 ConnectJoint()

```
bool SG.SG_Grabable.ConnectJoint (
             Rigidbody other,
             float breakForce = SG_Grabable.defaultBreakForce )
```

Connect this Grabable's rigidBody to another using a FixedJoint

Parameters

other	

Returns

True, if the connection was sucesfully made.

5.27.2.4 InteractionBegin()

```
override bool SG.SG_Grabable.InteractionBegin (
             SG_GrabScript grabScript,
             bool fromExternal = false )  [protected], [virtual]
```

Called when a SG_GrabScript initiates an interaction with this grabable.

Parameters

grabScript	
fromExternal	

Implements SG.SG_Interactable.

5.27.2.5 InteractionEnd()

```
override bool SG.SG_Grabable.InteractionEnd (
             SG_GrabScript grabScript,
             bool fromExternal = false )  [protected], [virtual]
```

Called when a SG_GrabScript no longer wishes to interact with this grabable.

Parameters

grabScript	
fromExternal	

Implements SG.SG_Interactable.

5.27.2.6 IsGrabbed()

```
bool SG.SG_Grabable.IsGrabbed ( )
```

Check if this Interactable is currently being held by a SenseGlove GrabScript.

Returns

5.27.2.7 ResetObject()

```
override void SG.SG_Grabable.ResetObject ( )  [virtual]
```

Reset this object back to its original position. Removes all connections between this and grabscripts.

Reimplemented from SG.SG_Interactable.

5.27.2.8 SaveRBParameters()

```
virtual void SG.SG_Grabable.SaveRBParameters ( )  [virtual]
```

Store the RigidBody parameters of this Grabable

5.27.2.9 SaveTransform()

```
override void SG.SG_Grabable.SaveTransform ( )  [virtual]
```

Save this object's position and orientation, in case the ResetObject function is called.

Reimplemented from SG.SG_Interactable.

5.27.2.10 SetCollision()

```
void SG.SG_Grabable.SetCollision (
            bool active )
```

Enable/Disable rigidbody collision of this Grabable.

Parameters

active	

5.27.2.11 SnapMeTo()

```
void SG.SG_Grabable.SnapMeTo (
             Transform originToMatch )
```

Moves this Grbabale such that its snapRefrence matches the rotation and position of the originToMatch.

Parameters

originToMatch	

5.27.2.12 UpdateInteraction()

```
override void SG.SG_Grabable.UpdateInteraction ( )  [virtual]
```

Called when this object is being held and the GrabReference is updated.

Reimplemented from SG.SG_Interactable.

5.27.2.13 ZeroVelocity()

```
void SG.SG_Grabable.ZeroVelocity ( )
```

Set the Velocities of this script to 0. Stops the grabable from rotating / flying away.

5.27.3 Member Data Documentation

5.27.3.1 attachMethod

```
AttachType SG.SG_Grabable.attachMethod = AttachType.Default
```

The way this object connects itself to the grabscript.

5.27.3.2 canTransfer

```
bool SG.SG_Grabable.canTransfer = true
```

Whether or not this object can be picked up by another Grabscript while it is being held.

5.27.3.3 grabOffset

```
Vector3 SG.SG_Grabable.grabOffset = Vector3.zero  [protected]
```

The xyz offset of this Grabable's transform to the grabReference, on the moment it was picked up.

5.27.3.4 grabReference

```
GameObject SG.SG_Grabable.grabReference  [protected]
```

The gameObject used as a reference for the Grabable's transform updates.

5.27.3.5 grabRotation

```
Quaternion SG.SG_Grabable.grabRotation = Quaternion.identity  [protected]
```

The quaternion offset of this Grabable's transform to the grabReference, on the moment it was picked up.

5.27.3.6 physicsBody

```
Rigidbody SG.SG_Grabable.physicsBody
```

The rigidBody to which velocity, gravity and kinematic options are applied.

5.27.3.7 pickupMethod

```
GrabType SG.SG_Grabable.pickupMethod = GrabType.Parent
```

The way that this object is be picked up by a GrabScript.

5.27.3.8 pickupReference

```
Transform SG.SG_Grabable.pickupReference
```

The transform that is grabbed instead of this object. Useful when dealing with a grabable that is a child of another grabable.

5.27.3.9 snapReference

```
Transform SG.SG_Grabable.snapReference
```

If this object has an attachType of SnapToAnchor, this transform is used as a refrence.

5.27.3.10 usedGravity

```
bool SG.SG_Grabable.usedGravity  [protected]
```

Whether this grabable's physicsBody was used gravity before it was picked up.

5.27.3.11 wasKinematic

```
bool SG.SG_Grabable.wasKinematic  [protected]
```

Whether this grabable's physicsBody was kinematic before it was picked up.

5.27.4 Property Documentation

5.27.4.1 OriginalParent

```
Transform SG.SG_Grabable.OriginalParent  [get], [set]
```

The original parent of this Grabable, before any GrabScripts picked it up.

5.27.4.2 UsedGravity

```
bool SG.SG_Grabable.UsedGravity  [get], [set]
```

Whether this Grabable used gravity before it was picked up

5.27.4.3 WasKinematic

```
bool SG.SG_Grabable.WasKinematic  [get], [set]
```

Whether this Grabable was marked as Kinematic before it was picked up

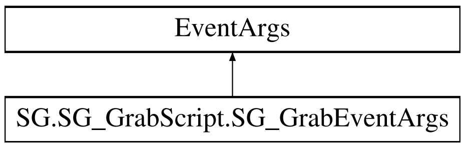
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Interaction/SG_Grabable.cs

5.28 SG.SG_GrabScript.SG_GrabEventArgs Class Reference

Event Arguments for grabbing/releasing of objects.

Inheritance diagram for SG.SG_GrabScript.SG_GrabEventArgs:



Public Member Functions

- **SG_GrabEventArgs** (SG_Interactable obj)

Properties

- SG_Interactable Interactable `[get, protected set]`
  The object that is being grabbed or released

5.28.1 Detailed Description

Event Arguments for grabbing/releasing of objects.

5.28.2 Property Documentation

5.28.2.1 Interactable

```
SG_Interactable SG.SG_GrabScript.SG_GrabEventArgs.Interactable  [get], [protected set]
```

The object that is being grabbed or released

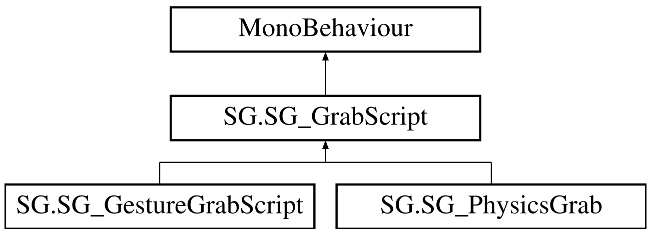
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Grabbing/SG_GrabScript.cs

5.29 SG.SG_GrabScript Class Reference

A Grabscript that uses a number of the Sense Glove's data to start and end interactions.

Inheritance diagram for SG.SG_GrabScript:



Classes

- class SG_GrabEventArgs

  Event Arguments for grabbing/releasing of objects.

Public Member Functions

- virtual bool GetHardware (out SG_SenseGloveHardware hardware)

  Returns true if this GrabScript is connected to Sense Glove Hardware and returns a refernce to it. Used in an if statement for safety
- virtual void CheckForScripts ()

  Check for relevant scripts connected to this one, that may not yet have been assigned.
- Vector3 GetVelocity ()

  Retrieve the Velocity of this Grabscript in m/s
- Vector3 GetAngularVelocity ()

  Retrieve the angular velocity of this Grabscript in rad/s
- abstract bool Setup ()

  Run setup on this grabscript; creating and/or resizing the proper colliders etc.
- virtual void ManualRelease (float timeToReactivate=1.0f)

  Manually force the SenseGlove_PhysGrab to drop whatever it is holding.
- abstract bool CanInteract ()

  Returns true if this grabscript can currently pickup an object
- virtual SG_Interactable[ ] HeldObjects ()

  Return a list of GameObjects that this script is Currently Interacting with.
- virtual bool IsGrabbing ()

  Returns true if this grabscript is currently holding an object
- virtual bool IsGrabbing (SG_Interactable obj)

  Returns true if this GrabScript is grabbing a specific SG_Interactable.
- abstract bool IsTouching ()

  Returns true if the grabscript is touching an object
- virtual void ClearHeldObjects ()

  Remove any references to held objects, restoring the GrabScript as though it has not touched anything yet.
- abstract void UpdateGrabScript ()

  Update the Grabscript logic; called automatically every Update() frame
- virtual void EndInteraction (SG_Interactable obj)

  If this grabscript is holding obj, end its interaction with it.
- delegate void GrabEventHandler (object source, SG_GrabEventArgs args)

  Event Handler for grabbing/releasing objects

Public Attributes

- SG_SenseGloveHardware hardware

  A SG_SenseGloveHardware for gloveData related shenanigans.
- GameObject grabReference

  When an object is picked up, this GameObject (Typically the wrist) is used as a reference for its movement / parent / fixedJoint.
- Rigidbody grabAnchor

  A Rigidbody that is used as an anchor when interacting with an object via a FixedJoint.

Protected Member Functions

- virtual void UpdateDynamics ()

  Update the dynamics (velocity, angular velocity) of the grabreference.
- virtual bool CanRelease (SG_Interactable obj)

  Check if this GrabScript is allowed to release an object, based on its release parameters.
- void OnGrabbedObject (SG_Interactable obj)

  Calls the ObjectGrabbed event
- void OnReleasedObject (SG_Interactable obj)

  Calls an ObjectReleased event.
- virtual void TryGrabObject (SG_Interactable obj)

  Attempt to grab an Interactable. If succesful, fire the ObjectGrabbed event.
- virtual int ReleaseObjectAt (int index)

  Attempt to release an Interactable in heldObjects. If succesful, fire the ObjectReleased event.
- virtual void **Awake** ()
- virtual void **Start** ()
- virtual void **Update** ()
- virtual void **LateUpdate** ()
- virtual void **OnDisable** ()

Protected Attributes

- bool setupFinished = false

  Becomes true after the colliders have been succesfully assigned.
- List< SG_Interactable > heldObjects = new List<SG_Interactable>(2)

  The object(s) that are being held by this script.
- List< Vector3 > velocities = new List<Vector3>()

  The velocity during the previous frames.
- List< Vector3 > angularVelocities = new List<Vector3>()

  The angular velocity during the previous frames.
- Vector3 lastPosition = Vector3.zero

  The grabReference's position during the last frame.
- Quaternion lastRotation = Quaternion.identity

  The grabReference's rotation during the last frame.
- bool paused = false

  If paused, the GrabScript will no longer raise events or grab objects untill the pauseTime has elapsed.
- float pauseTime = 1.0f

  The time [s] that needs to elapse before the GrabScript can pick up another object.
- float elapsedTime = 0

  The amount of time that has elpased since the Manual Release function was called.

Static Protected Attributes

- static int maxDataPoints = 5

  The maximum frames for which to keep track of velocities.

Properties

- virtual bool DebugEnabled `[set]`

  Show/Hide the debug elements (colliders, DrawLines) of this GrabScript.
- SG_TrackedHand Hand `[get, protected set]`

  The TrackedHand this GrabScript is connected to, used to access animation, hardware, etc.
- virtual bool HardwareReady `[get]`

  Returns true if this GrabScript is connected to Hardware that is ready to go

Events

- GrabEventHandler ObjectGrabbed

  Fires when a SG_GrabScript's grabs an object.
- GrabEventHandler ObjectReleased

  Fires when a SG_GrabScript's releases an object.

5.29.1 Detailed Description

A Grabscript that uses a number of the Sense Glove's data to start and end interactions.

5.29.2 Member Function Documentation

5.29.2.1 CanInteract()

```
abstract bool SG.SG_GrabScript.CanInteract ( )  [pure virtual]
```

Returns true if this grabscript can currently pickup an object

Returns

Implemented in SG.SG_PhysicsGrab, and SG.SG_GestureGrabScript.

5.29.2.2 CanRelease()

```
virtual bool SG.SG_GrabScript.CanRelease (
            SG_Interactable obj )  [protected], [virtual]
```

Check if this GrabScript is allowed to release an object, based on its release parameters.

Parameters

obj	

Returns

Reimplemented in SG.SG_PhysicsGrab.

5.29.2.3 CheckForScripts()

```
virtual void SG.SG_GrabScript.CheckForScripts ( )  [virtual]
```

Check for relevant scripts connected to this one, that may not yet have been assigned.

Reimplemented in SG.SG_PhysicsGrab.

5.29.2.4 ClearHeldObjects()

```
virtual void SG.SG_GrabScript.ClearHeldObjects ( )  [virtual]
```

Remove any references to held objects, restoring the GrabScript as though it has not touched anything yet.

5.29.2.5 EndInteraction()

```
virtual void SG.SG_GrabScript.EndInteraction (
             SG_Interactable obj )  [virtual]
```

If this grabscript is holding obj, end its interaction with it.

Parameters

obj	
callEvent	Call the EndInteraction on this object.

5.29.2.6 GetAngularVelocity()

```
Vector3 SG.SG_GrabScript.GetAngularVelocity ( )
```

Retrieve the angular velocity of this Grabscript in rad/s

Returns

5.29.2.7 GetHardware()

```
virtual bool SG.SG_GrabScript.GetHardware (
            out SG_SenseGloveHardware hardware )  [virtual]
```

Returns true if this GrabScript is connected to Sense Glove Hardware and returns a refernce to it. Used in an if statement for safety

Parameters

hardware	

Returns

5.29.2.8 GetVelocity()

```
Vector3 SG.SG_GrabScript.GetVelocity ( )
```

Retrieve the Velocity of this Grabscript in m/s

Returns

5.29.2.9 GrabEventHandler()

```
delegate void SG.SG_GrabScript.GrabEventHandler (
            object source,
            SG_GrabEventArgs args )
```

Event Handler for grabbing/releasing objects

Parameters

source	
args	

5.29.2.10 HeldObjects()

```
virtual SG_Interactable [] SG.SG_GrabScript.HeldObjects ( )  [virtual]
```

Return a list of GameObjects that this script is Currently Interacting with.

Returns

5.29.2.11 IsGrabbing() [1/2]

```
virtual bool SG.SG_GrabScript.IsGrabbing ( )  [virtual]
```

Returns true if this grabscript is currently holding an object

5.29.2.12 IsGrabbing() [2/2]

```
virtual bool SG.SG_GrabScript.IsGrabbing (
             SG_Interactable obj )  [virtual]
```

Returns true if this GrabScript is grabbing a specific SG_Interactable.

Parameters

obj	

Returns

5.29.2.13 IsTouching()

```
abstract bool SG.SG_GrabScript.IsTouching ( )  [pure virtual]
```

Returns true if the grabscript is touching an object

Returns

Implemented in SG.SG_PhysicsGrab, and SG.SG_GestureGrabScript.

5.29.2.14 ManualRelease()

```
virtual void SG.SG_GrabScript.ManualRelease (
             float timeToReactivate = 1.0f )  [virtual]
```

Manually force the SenseGlove_PhysGrab to drop whatever it is holding.

Parameters

time	The amount of time before the Grabscript can pick up objects again

5.29.2.15 OnGrabbedObject()

```
void SG.SG_GrabScript.OnGrabbedObject (
             SG_Interactable obj )  [protected]
```

Calls the ObjectGrabbed event

Parameters

obj	

5.29.2.16 OnReleasedObject()

```
void SG.SG_GrabScript.OnReleasedObject (
             SG_Interactable obj )  [protected]
```

Calls an ObjectReleased event.

Parameters

obj	

5.29.2.17 ReleaseObjectAt()

```
virtual int SG.SG_GrabScript.ReleaseObjectAt (
             int index )  [protected], [virtual]
```

Attempt to release an Interactable in heldObjects. If succesful, fire the ObjectReleased event.

Parameters

index	

Returns

5.29.2.18 Setup()

```
abstract bool SG.SG_GrabScript.Setup ( )  [pure virtual]
```

Run setup on this grabscript; creating and/or resizing the proper colliders etc.

Returns

Implemented in SG.SG_PhysicsGrab, and SG.SG_GestureGrabScript.

5.29.2.19 TryGrabObject()

```
virtual void SG.SG_GrabScript.TryGrabObject (
             SG_Interactable obj )  [protected], [virtual]
```

Attempt to grab an Interactable. If succesful, fire the ObjectGrabbed event.

Parameters

obj	

5.29.2.20 UpdateDynamics()

```
virtual void SG.SG_GrabScript.UpdateDynamics ( )  [protected], [virtual]
```

Update the dynamics (velocity, angular velocity) of the grabreference.

5.29.2.21 UpdateGrabScript()

```
abstract void SG.SG_GrabScript.UpdateGrabScript ( )  [pure virtual]
```

Update the Grabscript logic; called automatically every Update() frame

Implemented in SG.SG_PhysicsGrab, and SG.SG_GestureGrabScript.

5.29.3 Member Data Documentation

5.29.3.1 angularVelocities

```
List<Vector3> SG.SG_GrabScript.angularVelocities = new List<Vector3>()  [protected]
```

The angular velocity during the previous frames.

5.29.3.2 elapsedTime

```
float SG.SG_GrabScript.elapsedTime = 0  [protected]
```

The amount of time that has elpased since the Manual Release function was called.

5.29.3.3 grabAnchor

```
Rigidbody SG.SG_GrabScript.grabAnchor
```

A Rigidbody that is used as an anchor when interacting with an object via a FixedJoint.

5.29.3.4 grabReference

```
GameObject SG.SG_GrabScript.grabReference
```

When an object is picked up, this GameObject (Typically the wrist) is used as a reference for its movement / parent / fixedJoint.

5.29.3.5 hardware

```
SG_SenseGloveHardware SG.SG_GrabScript.hardware
```

A SG_SenseGloveHardware for gloveData related shenanigans.

5.29.3.6 heldObjects

```
List<SG_Interactable> SG.SG_GrabScript.heldObjects = new List<SG_Interactable>(2)  [protected]
```

The object(s) that are being held by this script.

5.29.3.7 lastPosition

```
Vector3 SG.SG_GrabScript.lastPosition = Vector3.zero  [protected]
```

The grabReference's position during the last frame.

5.29.3.8 lastRotation

```
Quaternion SG.SG_GrabScript.lastRotation = Quaternion.identity  [protected]
```

The grabReference's rotation during the last frame.

5.29.3.9 maxDataPoints

```
int SG.SG_GrabScript.maxDataPoints = 5  [static], [protected]
```

The maximum frames for which to keep track of velocities.

5.29.3.10 paused

```
bool SG.SG_GrabScript.paused = false  [protected]
```

If paused, the GrabScript will no longer raise events or grab objects untill the pauseTime has elapsed.

5.29.3.11 pauseTime

```
float SG.SG_GrabScript.pauseTime = 1.0f  [protected]
```

The time [s] that needs to elapse before the GrabScript can pick up another object.

5.29.3.12 setupFinished

```
bool SG.SG_GrabScript.setupFinished = false  [protected]
```

Becomes true after the colliders have been succesfully assigned.

5.29.3.13 velocities

```
List<Vector3> SG.SG_GrabScript.velocities = new List<Vector3>()  [protected]
```

The velocity during the previous frames.

5.29.4 Property Documentation

5.29.4.1 DebugEnabled

```
virtual bool SG.SG_GrabScript.DebugEnabled  [set]
```

Show/Hide the debug elements (colliders, DrawLines) of this GrabScript.

5.29.4.2 Hand

```
SG_TrackedHand SG.SG_GrabScript.Hand  [get], [protected set]
```

The TrackedHand this GrabScript is connected to, used to access animation, hardware, etc.

5.29.4.3 HardwareReady

```
virtual bool SG.SG_GrabScript.HardwareReady  [get]
```

Returns true if this GrabScript is connected to Hardware that is ready to go

5.29.5 Event Documentation

5.29.5.1 ObjectGrabbed

```
GrabEventHandler SG.SG_GrabScript.ObjectGrabbed
```

Fires when a SG_GrabScript's grabs an object.

5.29.5.2 ObjectReleased

```
GrabEventHandler SG.SG_GrabScript.ObjectReleased
```

Fires when a SG_GrabScript's releases an object.

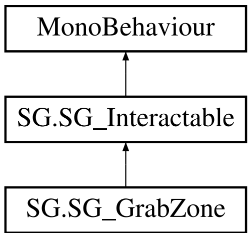
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Grabbing/SG_GrabScript.cs

5.30 SG.SG_GrabZone Class Reference

Creates a zone that extends its SG_Interactable methods to other objects, essentially creating a handle for (multiple) other Interactables.

Inheritance diagram for SG.SG_GrabZone:



Public Member Functions

- bool ConnectTo (SG_Interactable obj)

    Connect a new Interactable to this GrabZone. Returns true if succesful.
- override void UpdateInteraction ()

    Pass the updateInteraction on to all connected SenseGlove_Interactables.
- override void ResetObject ()

    Pass the ResetObject on to all connected SenseGlove_Interactables.
- override void SaveTransform ()

    Pass the SaveTransform function to all connected Interactables.

Public Attributes

- List< SG_Interactable > connectedTo = new List<SG_Interactable>()

  The Interactables that this Grabzone is connected to.

Protected Member Functions

- override bool InteractionBegin (SG_GrabScript grabScript, bool fromExternal=false)

  Pass the BeginInteraction on to all connected SenseGlove_Interactables.
- override bool InteractionEnd (SG_GrabScript grabScript, bool fromExternal=false)

  Pass the EndInteraction on to all connected SenseGlove_Interactables.

Private Member Functions

- void **Awake** ()
- int ConnectionIndex (SG_Interactable obj)

  Check if a SG_Interactable is already connected to this GrabZone.

Additional Inherited Members

5.30.1 Detailed Description

Creates a zone that extends its SG_Interactable methods to other objects, essentially creating a handle for (multiple) other Interactables.

5.30.2 Member Function Documentation

5.30.2.1 ConnectionIndex()

```
int SG.SG_GrabZone.ConnectionIndex (
            SG_Interactable obj )  [private]
```

Check if a SG_Interactable is already connected to this GrabZone.

Parameters

obj	

Returns

5.30.2.2 ConnectTo()

```
bool SG.SG_GrabZone.ConnectTo (
            SG_Interactable obj )
```

Connect a new Interactable to this GrabZone. Returns true if succesful.

Parameters

obj	

Returns

5.30.2.3 InteractionBegin()

```
override bool SG.SG_GrabZone.InteractionBegin (
            SG_GrabScript grabScript,
            bool fromExternal = false ) [protected], [virtual]
```

Pass the BeginInteraction on to all connected SenseGlove_Interactables.

Parameters

grabScript	

Implements SG.SG_Interactable.

5.30.2.4 InteractionEnd()

```
override bool SG.SG_GrabZone.InteractionEnd (
            SG_GrabScript grabScript,
            bool fromExternal = false ) [protected], [virtual]
```

Pass the EndInteraction on to all connected SenseGlove_Interactables.

Parameters

grabScript	

Implements SG.SG_Interactable.

5.30.2.5 ResetObject()

```
override void SG.SG_GrabZone.ResetObject ( )  [virtual]
```

Pass the ResetObject on to all connected SenseGlove_Interactables.

Reimplemented from SG.SG_Interactable.

5.30.2.6 SaveTransform()

```
override void SG.SG_GrabZone.SaveTransform ( )  [virtual]
```

Pass the SaveTransform function to all connected Interactables.

Reimplemented from SG.SG_Interactable.

5.30.2.7 UpdateInteraction()

```
override void SG.SG_GrabZone.UpdateInteraction ( )  [virtual]
```

Pass the updateInteraction on to all connected SenseGlove_Interactables.

Reimplemented from SG.SG_Interactable.

5.30.3 Member Data Documentation

5.30.3.1 connectedTo

```
List<SG_Interactable> SG.SG_GrabZone.connectedTo = new List<SG_Interactable>()
```

The Interactables that this Grabzone is connected to.

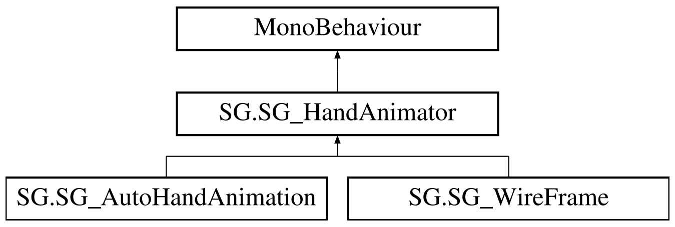
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Interaction/SG_Grab←
Zone.cs

5.31 SG.SG_HandAnimator Class Reference

A Generic Script that can be extended to work with most hand models. It requires the developer to assign the correct transforms for each joint. All of its methods can be overridden to create custom solutions.

Inheritance diagram for SG.SG_HandAnimator:



Public Member Functions

- virtual bool GetHardware (out SG_SenseGloveHardware hardware)

  Returns true if this Animator is connected to Sense Glove Hardware. Used in an if statement for safety
- virtual void CollectHandParameters ()

  collects the starting positions and rotations of the VHM, which can later be applied to Sense Glove models
- void CalibrateWrist ()

  Calibrate the wrist model of this handModel.
- virtual void UpdateHand (SG_SenseGloveData data)

  Update the (absolute) finger orientations, which move realtive to the (absolute) wrist transform. Note: This method is called after UpdateWrist() is called.
- virtual void UpdateWrist (SG_SenseGloveData data)

  Update the (absolute) wrist orientation, which moves realtive to the (absolute) lower arm transform. Note: This method is called before UpdateFingers() is called.
- virtual void ResizeHand (float[ ][ ] newLengths)

  Resize the finger lengths of this hand model to reflect that of the current user.

Static Public Member Functions

- static Vector3 DifferenceFromWrist (Transform wristTransfrom, Vector3 absPos)

  Calculates the difference between an absolute position and the wrist transform, without scaling.

Public Attributes

- SG_SenseGloveHardware senseGlove

  The Sense Glove that controls this hand model. /summary>
- bool updateWrist = false

  Whether or not to update the wrist of this Hand Model.
- Transform foreArmTransfrom

  The GameObject representing the Forearm.
- Transform wristTransfrom

  The GameObject representing the Wrist, moves relative to the foreArm.

Protected Member Functions

- virtual void CheckForScripts ()

    Check for Scripts relevant for this Animator
- virtual void SenseGlove_OnGloveLoaded (object source, System.EventArgs args)

    Utility method when the Sense Glove finishes loading. Determine left / right, for example.
- virtual void SenseGlove_OnCalibrationFinished (object source, SG_SenseGloveHardware.GloveCalibrationArgs args)

    Call the ResizeFingers function.
- abstract void CollectFingerJoints ()

    Collect a proper (finger x joint) array, and assign it to this.fingerJoints(). Use the handRoot variable to help you iterate.
- virtual void CollectCorrections ()

    Collect the absolute angles of the fingers in their 'calibration' pose, correct these with the current wrist orientation.
- virtual void **Start** ()
- virtual void **Update** ()

Protected Attributes

- bool updateFingers = true

    Whether or not to update the fingers of this Hand Model.
- bool resizeFingers = false

    Whether or not to resize the fingers after calibration completes.
- Transform[ ][ ] fingerJoints = new Transform[0][ ]

    The list of finger joint transforms, used to manipulate the angles. Assigned in the CollectFingerJoints() function.
- List< List< Quaternion > > fingerCorrection = new List<List<Quaternion>>()

    The initial angles of the hand model, corresponding to (0, 0, 0) rotation of the fingers.
- Quaternion wristCorrection = Quaternion.identity

    Offset between the wrist and lower arm, used when updating the wrist transfrom.
- Quaternion wristCalibration = Quaternion.identity

    Quaternion that aligns the lower arm with the wrist at the moment of calibration.
- Quaternion wristAngles = Quaternion.identity

    The relative angles between wrist and lower arm transforms.
- GameObject debugGroup

    A container for the motor level debug texts to easily toggle it on/off.
- TextMesh[ ] debugText

    Show the motor levels as determine by the feedback colliders on the fingers.
- Vector3[ ] **_jointPositions** = new Vector3[0]
- Vector3[ ][ ] **_handLengths** = new Vector3[0][ ]

Properties

- SG_TrackedHand Hand `[get, protected set]`

    The TrackedHand this Animator takes its data from, used to access grabscript, hardware, etc.
- virtual bool HardwareReady `[get]`

    Returns true if this Animator is connected to Hardware that is ready to go
- Quaternion RelativeWrist `[get]`

    Retrieve the Quaterion rotation between this model's foreArm and Wrist.
- Vector3 WristAngles `[get]`

    Retrive the euler angles between this model's foreArm and Wrist.

5.31.1 Detailed Description

A Generic Script that can be extended to work with most hand models. It requires the developer to assign the correct transforms for each joint. All of its methods can be overridden to create custom solutions.

5.31.2 Member Function Documentation

5.31.2.1 CalibrateWrist()

```
void SG.SG_HandAnimator.CalibrateWrist ( )
```

Calibrate the wrist model of this handModel.

5.31.2.2 CheckForScripts()

```
virtual void SG.SG_HandAnimator.CheckForScripts ( )  [protected], [virtual]
```

Check for Scripts relevant for this Animator

Reimplemented in SG.SG_AutoHandAnimation.

5.31.2.3 CollectCorrections()

```
virtual void SG.SG_HandAnimator.CollectCorrections ( )  [protected], [virtual]
```

Collect the absolute angles of the fingers in their 'calibration' pose, correct these with the current wrist orientation.

5.31.2.4 CollectFingerJoints()

```
abstract void SG.SG_HandAnimator.CollectFingerJoints ( )  [protected], [pure virtual]
```

Collect a proper (finger x joint) array, and assign it to this.fingerJoints(). Use the handRoot variable to help you iterate.

Implemented in SG.SG_WireFrame, and SG.SG_AutoHandAnimation.

5.31.2.5 CollectHandParameters()

```
virtual void SG.SG_HandAnimator.CollectHandParameters ( )  [virtual]
```

collects the starting positions and rotations of the VHM, which can later be applied to Sense Glove models

5.31.2.6 DifferenceFromWrist()

```
static Vector3 SG.SG_HandAnimator.DifferenceFromWrist (
             Transform wristTransfrom,
             Vector3 absPos )  [static]
```

Calculates the difference between an absolute position and the wrist transform, without scaling.

Parameters

wristTransfrom	
absPos	

Returns

5.31.2.7 GetHardware()

```
virtual bool SG.SG_HandAnimator.GetHardware (
             out SG_SenseGloveHardware hardware )  [virtual]
```

Returns true if this Animator is connected to Sense Glove Hardware. Used in an if statement for safety

Parameters

hardware	

Returns

5.31.2.8 ResizeHand()

```
virtual void SG.SG_HandAnimator.ResizeHand (
             float newLengths[ ][ ] )  [virtual]
```

Resize the finger lengths of this hand model to reflect that of the current user.

Parameters

newLengths	

Reimplemented in SG.SG_WireFrame.

5.31.2.9 SenseGlove_OnCalibrationFinished()

```
virtual void SG.SG_HandAnimator.SenseGlove_OnCalibrationFinished (
             object source,
             SG_SenseGloveHardware.GloveCalibrationArgs args )  [protected], [virtual]
```

Call the ResizeFingers function.

Parameters

source	
args	

Reimplemented in SG.SG_WireFrame.

5.31.2.10 SenseGlove_OnGloveLoaded()

```
virtual void SG.SG_HandAnimator.SenseGlove_OnGloveLoaded (
            object source,
            System.EventArgs args )  [protected], [virtual]
```

Utility method when the Sense Glove finishes loading. Determine left / right, for example.

Parameters

source	
args	

5.31.2.11 UpdateHand()

```
virtual void SG.SG_HandAnimator.UpdateHand (
            SG_SenseGloveData data )  [virtual]
```

Update the (absolute) finger orientations, which move realtive to the (absolute) wrist transform. Note: This method is called after UpdateWrist() is called.

Parameters

data	

Reimplemented in SG.SG_WireFrame.

5.31.2.12 UpdateWrist()

```
virtual void SG.SG_HandAnimator.UpdateWrist (
            SG_SenseGloveData data )  [virtual]
```

Update the (absolute) wrist orientation, which moves realtive to the (absolute) lower arm transform. Note: This method is called before UpdateFingers() is called.

Parameters

data	

5.31.3 Member Data Documentation

5.31.3.1 debugGroup

`GameObject SG.SG_HandAnimator.debugGroup [protected]`

A container for the motor level debug texts to easily toggle it on/off.

5.31.3.2 debugText

`TextMesh [ ] SG.SG_HandAnimator.debugText [protected]`

Show the motor levels as determine by the feedback colliders on the fingers.

5.31.3.3 fingerCorrection

`List<List<Quaternion> > SG.SG_HandAnimator.fingerCorrection = new List<List<Quaternion>>() [protected]`

The initial angles of the hand model, corresponding to (0, 0, 0) rotation of the fingers.

5.31.3.4 fingerJoints

`Transform [ ][ ] SG.SG_HandAnimator.fingerJoints = new Transform[0][ ] [protected]`

The list of finger joint transforms, used to manipulate the angles. Assigned in the CollectFingerJoints() function.

5.31.3.5 foreArmTransfrom

`Transform SG.SG_HandAnimator.foreArmTransfrom`

The GameObject representing the Forearm.

5.31.3.6 resizeFingers

```
bool SG.SG_HandAnimator.resizeFingers = false  [protected]
```

Whether or not to resize the fingers after calibration completes.

5.31.3.7 updateFingers

```
bool SG.SG_HandAnimator.updateFingers = true  [protected]
```

Whether or not to update the fingers of this Hand Model.

5.31.3.8 updateWrist

```
bool SG.SG_HandAnimator.updateWrist = false
```

Whether or not to update the wrist of this Hand Model.

5.31.3.9 wristAngles

```
Quaternion SG.SG_HandAnimator.wristAngles = Quaternion.identity  [protected]
```

The relative angles between wrist and lower arm transforms.

5.31.3.10 wristCalibration

```
Quaternion SG.SG_HandAnimator.wristCalibration = Quaternion.identity  [protected]
```

Quaternion that aligns the lower arm with the wrist at the moment of calibration.

5.31.3.11 wristCorrection

```
Quaternion SG.SG_HandAnimator.wristCorrection = Quaternion.identity  [protected]
```

Offset between the wrist and lower arm, used when updating the wrist transfrom.

5.31.3.12 wristTransfrom

```
Transform SG.SG_HandAnimator.wristTransfrom
```

The GameObject representing the Wrist, moves relative to the foreArm.

5.31.4 Property Documentation

5.31.4.1 Hand

```
SG_TrackedHand SG.SG_HandAnimator.Hand  [get], [protected set]
```

The TrackedHand this Animator takes its data from, used to access grabscript, hardware, etc.

5.31.4.2 HardwareReady

```
virtual bool SG.SG_HandAnimator.HardwareReady  [get]
```

Returns true if this Animator is connected to Hardware that is ready to go

5.31.4.3 RelativeWrist

```
Quaternion SG.SG_HandAnimator.RelativeWrist  [get]
```

Retrieve the Quaterion rotation between this model's foreArm and Wrist.

5.31.4.4 WristAngles

```
Vector3 SG.SG_HandAnimator.WristAngles  [get]
```

Retrive the euler angles between this model's foreArm and Wrist.

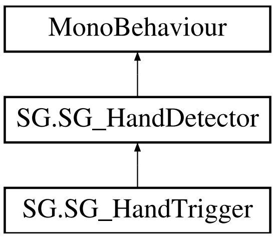
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Tracking/SG_Hand↩ Animator.cs

5.32 SG.SG_HandDetector Class Reference

A class to detect a SG_HandAnimator based on its SG_Feedback colliders

Inheritance diagram for SG.SG_HandDetector:



Classes

- class GloveDetectionArgs

  EventArgs fired when a glove is detected in or removed from a SenseGlove_Detector.

Public Types

- enum DetectionType { **AnyFinger** = 0, **SpecificFingers** }

  How a Sense Glove is detected through its Feedback scripts.

Public Member Functions

- void SetHighLight (bool active)

  Set the highlight of this Sense Glove on or off.
- bool ContainsSenseGlove ()

  Returns true if there is a Sense Glove contained within this detector.
- SG_SenseGloveHardware[ ] GlovesInside ()

  Get a list of all gloves within this detection area.
- delegate void **GloveDetectedEventHandler** (object source, GloveDetectionArgs args)
- delegate void **OnGloveRemovedEventHandler** (object source, GloveDetectionArgs args)
- void **ResetParameters** ()

Public Attributes

- DetectionType detectionMethod = DetectionType.AnyFinger

  General Colliders or Specific fingers.
- int activationThreshold = 1

  How many SG_Feedback colliders must enter the Detector before the GloveDetected event is raised.
- bool detectThumb = true

  Whether or not this detector is activated by a thumb when detecting specific fingers only.
- bool detectIndex = true

  Whether or not this detector is activated by an index finger when detecting specific fingers only.
- bool detectMiddle = true

  Whether or not this detector is activated by a middle finger when detecting specific fingers only.

- bool detectRing = true

  Whether or not this detector is activated by a ring finger when detecting specific fingers only.
- bool detectPinky = true

  Whether or not this detector is activated by a pinky finger when detecting specific fingers only.
- float activationTime = 0

  Optional: The time in seconds that the Sense Glove must be inside the detector for before the GloveDetected event is called.
- bool singleGlove = false

  If set to true, the detector will not raise events if a second handModel joins in.
- Renderer highLight

  An optional Highlight of this Detector that can be enabled / disabled.

Protected Member Functions

- virtual void **Start** ()
- virtual void **LateUpdate** ()
- virtual void FireDetectEvent (SG_SenseGloveHardware model)

  A step in between events that can be overridden by sub-classes of the SenseGlove_Detector
- virtual void FireRemoveEvent (SG_SenseGloveHardware model)

  A step in between events that can be overridden by sub-classes of the SenseGlove_Detector
- void **OnGloveDetected** (SG_SenseGloveHardware model)
- void **OnGloveRemoved** (SG_SenseGloveHardware model)

Protected Attributes

- List< SG_SenseGloveHardware > detectedGloves = new List<SG_SenseGloveHardware>()

  All of the grabscripts currently interacting with this detector, in order of appearance.
- List< bool > eventFired = new List<bool>()

  Used to determine if the activationtheshold had been reached before. Prevents the scipt from firing multiple times.

Events

- GloveDetectedEventHandler GloveDetected

  Fires when a new SG_GrabScript enters this detection zone and fullfils the detector's conditions.
- OnGloveRemovedEventHandler GloveRemoved

  Fires when a SG_GrabScript exits this detection zone and fullfils the detector's conditions.

Private Member Functions

- void **OnTriggerEnter** (Collider col)
- void **OnTriggerExit** (Collider col)
- int HandModelIndex (SG_SenseGloveHardware model)

  Returns the index of the SG_HandAnimator in this detector's detectedGloves. Returns -1 if it is not in the list.
- void AddEntry (SG_SenseGloveHardware model)

  Add a newly detected SenseGlove to the list of detected gloves.
- void RemoveEntry (int scriptIndex)

  Remove a handmodel at the specified index from the list of detected gloves.
- bool ValidScript (SG_HandSection handSection)

  Check if this scriptIndex is detectable by this Detector.
- bool **ValidScript** (SG_BasicFeedback touch)

Private Attributes

- List< int > detectedColliders = new List<int>()

  The amount of SenseGlove_Touch colliders of each grabscript that are currently in the detection area
- List< float > detectionTimes = new List<float>()

  Used to keep track of the time that each glove have been inside this detector.
- Collider myCollider

  The collider of this detection area. Assigned on startup
- Rigidbody myRigidbody

  The rigidbody of this detection area. Assigned on StartUp

5.32.1 Detailed Description

A class to detect a SG_HandAnimator based on its SG_Feedback colliders

5.32.2 Member Enumeration Documentation

5.32.2.1 DetectionType

```
enum SG.SG_HandDetector.DetectionType  [strong]
```

How a Sense Glove is detected through its Feedback scripts.

5.32.3 Member Function Documentation

5.32.3.1 AddEntry()

```
void SG.SG_HandDetector.AddEntry (
            SG_SenseGloveHardware model )  [private]
```

Add a newly detected SenseGlove to the list of detected gloves.

Parameters

model	

5.32.3.2 ContainsSenseGlove()

```
bool SG.SG_HandDetector.ContainsSenseGlove ( )
```

Returns true if there is a Sense Glove contained within this detector.

Returns

5.32.3.3 FireDetectEvent()

```
virtual void SG.SG_HandDetector.FireDetectEvent (
            SG_SenseGloveHardware model )  [protected], [virtual]
```

A step in between events that can be overridden by sub-classes of the SenseGlove_Detector

Parameters

model	

Reimplemented in SG.SG_HandTrigger.

5.32.3.4 FireRemoveEvent()

```
virtual void SG.SG_HandDetector.FireRemoveEvent (
            SG_SenseGloveHardware model )  [protected], [virtual]
```

A step in between events that can be overridden by sub-classes of the SenseGlove_Detector

Parameters

model	

Reimplemented in SG.SG_HandTrigger.

5.32.3.5 GlovesInside()

```
SG_SenseGloveHardware [] SG.SG_HandDetector.GlovesInside ( )
```

Get a list of all gloves within this detection area.

Returns

5.32.3.6 HandModelIndex()

```
int SG.SG_HandDetector.HandModelIndex (
            SG_SenseGloveHardware model )  [private]
```

Returns the index of the SG_HandAnimator in this detector's detectedGloves. Returns -1 if it is not in the list.

Parameters

grab	

Returns

5.32.3.7 RemoveEntry()

```
void SG.SG_HandDetector.RemoveEntry (
            int scriptIndex )  [private]
```

Remove a handmodel at the specified index from the list of detected gloves.

Parameters

scriptIndex	

5.32.3.8 SetHighLight()

```
void SG.SG_HandDetector.SetHighLight (
            bool active )
```

Set the highlight of this Sense Glove on or off.

Parameters

active	

5.32.3.9 ValidScript()

```
bool SG.SG_HandDetector.ValidScript (
            SG_HandSection handSection )  [private]
```

Check if this scriptIndex is detectable by this Detector.

Parameters

scriptIndex	

Returns

5.32.4 Member Data Documentation

5.32.4.1 activationThreshold

```
int SG.SG_HandDetector.activationThreshold = 1
```

How many SG_Feedback colliders must enter the Detector before the GloveDetected event is raised.

5.32.4.2 activationTime

```
float SG.SG_HandDetector.activationTime = 0
```

Optional: The time in seconds that the Sense Glove must be inside the detector for before the GloveDetected event is called.

5.32.4.3 detectedColliders

```
List<int> SG.SG_HandDetector.detectedColliders = new List<int>()  [private]
```

The amount of SenseGlove_Touch colliders of each grabscript that are currently in the detection area

5.32.4.4 detectedGloves

```
List<SG_SenseGloveHardware> SG.SG_HandDetector.detectedGloves = new List<SG_SenseGloveHardware>()
[protected]
```

All of the grabscripts currently interacting with this detector, in order of appearance.

5.32.4.5 detectIndex

```
bool SG.SG_HandDetector.detectIndex = true
```

Whether or not this detector is activated by an index finger when detecting specific fingers only.

5.32.4.6 detectionMethod

```
DetectionType SG.SG_HandDetector.detectionMethod = DetectionType.AnyFinger
```

General Colliders or Specific fingers.

5.32.4.7 detectionTimes

```
List<float> SG.SG_HandDetector.detectionTimes = new List<float>()  [private]
```

Used to keep track of the time that each glove have been inside this detector.

5.32.4.8 detectMiddle

```
bool SG.SG_HandDetector.detectMiddle = true
```

Whether or not this detector is activated by a middle finger when detecting specific fingers only.

5.32.4.9 detectPinky

```
bool SG.SG_HandDetector.detectPinky = true
```

Whether or not this detector is activated by a pinky finger when detecting specific fingers only.

5.32.4.10 detectRing

```
bool SG.SG_HandDetector.detectRing = true
```

Whether or not this detector is activated by a ring finger when detecting specific fingers only.

5.32.4.11 detectThumb

```
bool SG.SG_HandDetector.detectThumb = true
```

Whether or not this detector is activated by a thumb when detecting specific fingers only.

5.32.4.12 eventFired

```
List<bool> SG.SG_HandDetector.eventFired = new List<bool>()  [protected]
```

Used to determine if the activationtheshold had been reached before. Prevents the scipt from firing multiple times.

5.32.4.13 highLight

```
Renderer SG.SG_HandDetector.highLight
```

An optional Highlight of this Detector that can be enabled / disabled.

5.32.4.14 myCollider

```
Collider SG.SG_HandDetector.myCollider  [private]
```

The collider of this detection area. Assigned on startup

5.32.4.15 myRigidbody

```
Rigidbody SG.SG_HandDetector.myRigidbody  [private]
```

The rigidbody of this detection area. Assigned on StartUp

5.32.4.16 singleGlove

```
bool SG.SG_HandDetector.singleGlove = false
```

If set to true, the detector will not raise events if a second handModel joins in.

5.32.5 Event Documentation

5.32.5.1 GloveDetected

`GloveDetectedEventHandler SG.SG_HandDetector.GloveDetected`

Fires when a new SG_GrabScript enters this detection zone and fullfils the detector's conditions.

5.32.5.2 GloveRemoved

`OnGloveRemovedEventHandler SG.SG_HandDetector.GloveRemoved`

Fires when a SG_GrabScript exits this detection zone and fullfils the detector's conditions.

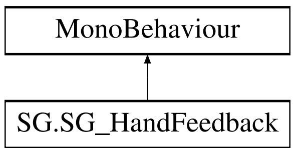
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Controls/SG_Hand↩ Detector.cs

5.33 SG.SG_HandFeedback Class Reference

This script collects the Force Feedback from the hand and sends these to its connected Hardware.

Inheritance diagram for SG.SG_HandFeedback:



Public Member Functions

- bool GetHardware (out SG_SenseGloveHardware hardware)

  Returns true if this FeedbackScript is connected to Sense Glove Hardware and returns a link to it. Used in an if statement for safety
- bool TouchingMaterial ()

  Returns true if at least one collider is touching a material.
- void SetIgnoreCollision (SG_HandRigidBodies otherLayer, bool ignoreCollision)

  Set ignoreCollision between this layer and another set of rigidbodies.
- void **SetIgnoreCollision** (GameObject obj, bool ignoreCollision)
- void **SetIgnoreCollision** (Collider col, bool ignoreCollision)
- void SetupScripts ()

  Sets up this script's components to link to the same glove and the appropriate hand section.
- void UpdateForces ()

  Retrieve the forces for each finger and send these to the glove.
- virtual void CheckForScripts ()

  Checks for scripts that might be connected to this GameObject. Used in editor and during startup.

Public Attributes

- SG_SenseGloveHardware connectedGlove

  The hardware that this script will send its Force-Feedback commands to
- SG_HandModelInfo handModel

  Information about the 3D model this script is connected to. Used to set up tracking for the fingers/wrist.
- SG_BasicFeedback wristFeedbackScript

  Impact script for the wrist, should be linked to this connectedGlove.
- SG_FingerFeedback[ ] fingerFeedbackScripts

  Feedback colliders on each of the fingers, sorted from thumb to pinky.

Properties

- SG_TrackedHand Hand `[get, protected set]`

  The TrackedHand this FeedbackScript takes its data from, used to access other components like grabscript, hardware, etc.
- bool HardwareReady `[get]`

  Returns true if this FeedbackScript is connected to Hardware that is ready to go
- bool DebugEnabled `[set]`

  Used to show/hide the feedback colliders of this hand.
- float[ ] ColliderDistances `[get]`

  returns the distance (in m) of the fingers inside a SG_Material collider, provided they are touching one.

Private Member Functions

- void **Awake** ()
- void **Update** ()

5.33.1 Detailed Description

This script collects the Force Feedback from the hand and sends these to its connected Hardware.

5.33.2 Member Function Documentation

5.33.2.1 CheckForScripts()

```
virtual void SG.SG_HandFeedback.CheckForScripts ( )  [virtual]
```

Checks for scripts that might be connected to this GameObject. Used in editor and during startup.

5.33.2.2 GetHardware()

```
bool SG.SG_HandFeedback.GetHardware (
            out SG_SenseGloveHardware hardware )
```

Returns true if this FeedbackScript is connected to Sense Glove Hardware and returns a link to it. Used in an if statement for safety

Parameters

hardware	

Returns

5.33.2.3 SetIgnoreCollision()

```
void SG.SG_HandFeedback.SetIgnoreCollision (
            SG_HandRigidBodies otherLayer,
            bool ignoreCollision )
```

Set ignoreCollision between this layer and another set of rigidbodies.

Parameters

otherLayer	
ignoreCollision	

5.33.2.4 SetupScripts()

```
void SG.SG_HandFeedback.SetupScripts ( )
```

Sets up this script's components to link to the same glove and the appropriate hand section.

5.33.2.5 TouchingMaterial()

```
bool SG.SG_HandFeedback.TouchingMaterial ( )
```

Returns true if at least one collider is touching a material.

Returns

5.33.2.6 UpdateForces()

```
void SG.SG_HandFeedback.UpdateForces ( )
```

Retrieve the forces for each finger and send these to the glove.

5.33.3 Member Data Documentation

5.33.3.1 connectedGlove

```
SG_SenseGloveHardware SG.SG_HandFeedback.connectedGlove
```

The hardware that this script will send its Force-Feedback commands to

5.33.3.2 fingerFeedbackScripts

```
SG_FingerFeedback [] SG.SG_HandFeedback.fingerFeedbackScripts
```

Feedback colliders on each of the fingers, sorted from thumb to pinky.

5.33.3.3 handModel

```
SG_HandModelInfo SG.SG_HandFeedback.handModel
```

Information about the 3D model this script is connected to. Used to set up tracking for the fingers/wrist.

5.33.3.4 wristFeedbackScript

```
SG_BasicFeedback SG.SG_HandFeedback.wristFeedbackScript
```

Impact script for the wrist, should be linked to this connectedGlove.

5.33.4 Property Documentation

5.33.4.1 ColliderDistances

```
float [] SG.SG_HandFeedback.ColliderDistances  [get]
```

returns the distance (in m) of the fingers inside a SG_Material collider, provided they are touching one.

5.33.4.2 DebugEnabled

```
bool SG.SG_HandFeedback.DebugEnabled  [set]
```

Used to show/hide the feedback colliders of this hand.

5.33.4.3 Hand

```
SG_TrackedHand SG.SG_HandFeedback.Hand  [get], [protected set]
```

The TrackedHand this FeedbackScript takes its data from, used to access other components like grabscript, hardware, etc.

5.33.4.4 HardwareReady

```
bool SG.SG_HandFeedback.HardwareReady  [get]
```

Returns true if this FeedbackScript is connected to Hardware that is ready to go

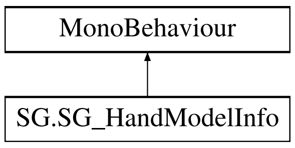
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Feedback/SG_Hand↩
Feedback.cs

5.34 SG.SG_HandModelInfo Class Reference

A script to assign information of hand joints, used by other scripts that use hand tracking.

Inheritance diagram for SG.SG_HandModelInfo:



Public Member Functions

- bool GetFingerTip (SG_HandSection finger, out Transform fingerTip)

  Retrieve the fingertip transform of this Hand Model.

Public Attributes

- Transform foreArmTransform

  The forearm of the hand model, usually the parent of the wrist transform.
- Transform wristTransform

  The transform of the wrist. Should be distinct from the foreArmTransform if wrist animation is not required.
- Transform[ ] thumbJoints = new Transform[0]

  The thumb joint transforms, preferably including the fingertip.
- Transform[ ] indexJoints = new Transform[0]

  The index joint transforms, preferably including the fingertip.
- Transform[ ] middleJoints = new Transform[0]

  The middle joint transforms, preferably including the fingertip.
- Transform[ ] ringJoints = new Transform[0]

  The ring joint transforms, preferably including the fingertip.
- Transform[ ] pinkyJoints = new Transform[0]

  The pinky joint transforms, preferably including the fingertip.

Protected Attributes

- GameObject[ ][ ] fingerDebug = null

  Debug objects to show the user where the finger joint transforms are.
- GameObject wristDebug = null

  Debug objects to show the user where the wrist transform is

Properties

- Transform[ ][ ] FingerJoints `[get]`

  Retreive all finger joints as an array of Transforms, sorted from thumb to pinky.
- bool DebugEnabled `[get, set]`

  Create/Destroy a set of small spheres on each of the hand model transforms.

5.34.1 Detailed Description

A script to assign information of hand joints, used by other scripts that use hand tracking.

5.34.2 Member Function Documentation

5.34.2.1 GetFingerTip()

```
bool SG.SG_HandModelInfo.GetFingerTip (
             SG_HandSection finger,
             out Transform fingerTip )
```

Retrieve the fingertip transform of this Hand Model.

Parameters

finger	
fingerTip	

Returns

5.34.3 Member Data Documentation

5.34.3.1 fingerDebug

```
GameObject [][] SG.SG_HandModelInfo.fingerDebug = null  [protected]
```

Debug objects to show the user where the finger joint transforms are.

5.34.3.2 foreArmTransform

```
Transform SG.SG_HandModelInfo.foreArmTransform
```

The forearm of the hand model, usually the parent of the wrist transform.

5.34.3.3 indexJoints

```
Transform [] SG.SG_HandModelInfo.indexJoints = new Transform[0]
```

The index joint transforms, preferably including the fingertip.

5.34.3.4 middleJoints

```
Transform [] SG.SG_HandModelInfo.middleJoints = new Transform[0]
```

The middle joint transforms, preferably including the fingertip.

5.34.3.5 pinkyJoints

```
Transform [] SG.SG_HandModelInfo.pinkyJoints = new Transform[0]
```

The pinky joint transforms, preferably including the fingertip.

5.34.3.6 ringJoints

```
Transform [] SG.SG_HandModelInfo.ringJoints = new Transform[0]
```

The ring joint transforms, preferably including the fingertip.

5.34.3.7 thumbJoints

```
Transform [] SG.SG_HandModelInfo.thumbJoints = new Transform[0]
```

The thumb joint transforms, preferably including the fingertip.

5.34.3.8 wristDebug

```
GameObject SG.SG_HandModelInfo.wristDebug = null  [protected]
```

Debug objects to show the user where the wrist transform is

5.34.3.9 wristTransform

```
Transform SG.SG_HandModelInfo.wristTransform
```

The transform of the wrist. Should be distinct from the foreArmTransform if wrist animation is not required.

5.34.4 Property Documentation

5.34.4.1 DebugEnabled

```
bool SG.SG_HandModelInfo.DebugEnabled  [get], [set]
```

Create/Destroy a set of small spheres on each of the hand model transforms.

5.34.4.2 FingerJoints

```
Transform [][] SG.SG_HandModelInfo.FingerJoints  [get]
```

Retreive all finger joints as an array of Transforms, sorted from thumb to pinky.

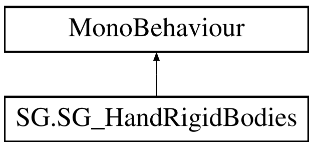
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Tracking/SG_HandModel←Info.cs

5.35 SG.SG_HandRigidBodies Class Reference

A script to manage a set of Rigidbodies that represent the hand geometry.

Inheritance diagram for SG.SG_HandRigidBodies:



Public Member Functions

- virtual bool GetHardware (out SG_SenseGloveHardware hardware)

  Returns true if this Animator is connected to Sense Glove Hardware. Used in an if statement for safety
- void SetIgnoreCollision (SG_HandRigidBodies otherLayer, bool ignoreCollision)

  Set ignoreCollision between this layer and another set of rigidbodies.
- void SetIgnoreCollision (GameObject obj, bool ignoreCollision)

  Set the ignoreCollision between this layer and a specific gameobject
- void SetIgnoreCollision (Collider col, bool ignoreCollision)

  Set the ignoreCollision between this layer and a specific collider
- void AddRigidBodies (bool useGrav=false, bool kinematic=false)

  Add Rigidbodies with proper parameters for this layer.
- void RemoveRigidBodies ()

  Removes rigidbodies from this layer, so their collision can become part of a different RigidBody.

Public Attributes

- SG_HandModelInfo handModel

  The hand model information, used to assign tracking information. If left unassinged, you'll need to assing them manually.
- SG_TrackedBody wristObj

  The managed rigidbody of the wrist
- SG_TrackedBody[ ] fingerObjs = new SG_TrackedBody[0]

  The managed rigidbody of the fingers, from thumb to pinky.

Protected Member Functions

- virtual void CheckForScripts ()
  Assign scripts relevant to this script's functioning.
- void SetupSelf ()
  Setup the tracking / parameters of this script's components.
- void **Awake** ()

Properties

- SG_TrackedHand Hand `[get, protected set]`
  The TrackedHand this Animator takes its data from, used to access grabscript, hardware, etc.
- virtual bool HardwareReady `[get]`
  Returns true if this Animator is connected to Hardware that is ready to go
- bool DebugEnabled `[set]`
  Show/Hide the the rigidbodies in this layer.
- bool CollisionsEnabled `[set]`
  Enable/Disable the overall collision of the rigidbodies in this layer.

5.35.1 Detailed Description

A script to manage a set of Rigidbodies that represent the hand geometry.

5.35.2 Member Function Documentation

5.35.2.1 AddRigidBodies()

```
void SG.SG_HandRigidBodies.AddRigidBodies (
            bool useGrav = false,
            bool kinematic = false )
```

Add Rigidbodies with proper parameters for this layer.

Parameters

useGrav	
kinematic	

5.35.2.2 CheckForScripts()

```
virtual void SG.SG_HandRigidBodies.CheckForScripts ( ) [protected], [virtual]
```

Assign scripts relevant to this script's functioning.

5.35.2.3 GetHardware()

```
virtual bool SG.SG_HandRigidBodies.GetHardware (
            out SG_SenseGloveHardware hardware )  [virtual]
```

Returns true if this Animator is connected to Sense Glove Hardware. Used in an if statement for safety

Parameters

hardware	

Returns

5.35.2.4 RemoveRigidBodies()

```
void SG.SG_HandRigidBodies.RemoveRigidBodies ( )
```

Removes rigidbodies from this layer, so their collision can become part of a different RigidBody.

5.35.2.5 SetIgnoreCollision() [1/3]

```
void SG.SG_HandRigidBodies.SetIgnoreCollision (
            Collider col,
            bool ignoreCollision )
```

Set the ignoreCollision between this layer and a specific collider

Parameters

obj	
ignoreCollision	

5.35.2.6 SetIgnoreCollision() [2/3]

```
void SG.SG_HandRigidBodies.SetIgnoreCollision (
            GameObject obj,
            bool ignoreCollision )
```

Set the ignoreCollision between this layer and a specific gameobject

Parameters

obj	
ignoreCollision	

5.35.2.7 SetIgnoreCollision() [3/3]

```
void SG.SG_HandRigidBodies.SetIgnoreCollision (
            SG_HandRigidBodies otherLayer,
            bool ignoreCollision )
```

Set ignoreCollision between this layer and another set of rigidbodies.

Parameters

otherLayer	
ignoreCollision	

5.35.2.8 SetupSelf()

```
void SG.SG_HandRigidBodies.SetupSelf ( )  [protected]
```

Setup the tracking / parameters of this script's components.

5.35.3 Member Data Documentation

5.35.3.1 fingerObjs

```
SG_TrackedBody [] SG.SG_HandRigidBodies.fingerObjs = new SG_TrackedBody[0]
```

The managed rigidbody of the fingers, from thumb to pinky.

5.35.3.2 handModel

```
SG_HandModelInfo SG.SG_HandRigidBodies.handModel
```

The hand model information, used to assign tracking information. If left unassinged, you'll need to assing them manually.

5.35.3.3 wristObj

```
SG_TrackedBody SG.SG_HandRigidBodies.wristObj
```

The managed rigidbody of the wrist

5.35.4 Property Documentation

5.35.4.1 CollisionsEnabled

```
bool SG.SG_HandRigidBodies.CollisionsEnabled  [set]
```

Enable/Disable the overall collision of the rigidbodies in this layer.

5.35.4.2 DebugEnabled

```
bool SG.SG_HandRigidBodies.DebugEnabled  [set]
```

Show/Hide the the rigidbodies in this layer.

5.35.4.3 Hand

```
SG_TrackedHand SG.SG_HandRigidBodies.Hand  [get], [protected set]
```

The TrackedHand this Animator takes its data from, used to access grabscript, hardware, etc.

5.35.4.4 HardwareReady

```
virtual bool SG.SG_HandRigidBodies.HardwareReady  [get]
```

Returns true if this Animator is connected to Hardware that is ready to go

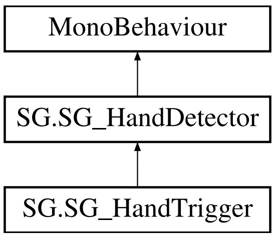
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Tracking/SG_HandRigid↩ Bodies.cs

5.36 SG.SG_HandTrigger Class Reference

A Detector that, when activated, triggers a series of in-game effects.

Inheritance diagram for SG.SG_HandTrigger:



Public Member Functions

- bool InUse ()
  Check if the trigger is in use by one or more sense gloves.
- void **SetAudio** (bool play)
- void SetParticles (bool play)
  Start / Stop the particleeffect
- void SetEffectObject (bool active)
  Enable/disable the "effectToShow" Gameobject

Public Attributes

- ParticleSystem particlesToPlay
  Particle effects that are shown when the glove is detected
- AudioSource audioToPlay
  (Optional) Audio to play if the glove is detected
- GameObject effectToShow
  (group of) game objects to show when the glove is detected.
- bool hapticFeedback = false
  (Optional) tells the glove to give haptic feedback
- int hapticForce = 100
  The magnitude of the haptic Feedback
- int hapticDuration = 200
  The duration of a haptic feedback pulse.
- bool[ ] whichFingers = new bool[5] { true, false, false, false, false }
  Which fingers to apply the Haptic feedback to
- bool loop = false
  If set to true, the haptic feedback is continuous while the glove is inside the trigger

Protected Member Functions

- override void FireDetectEvent (SG_SenseGloveHardware model)
  A step in between events that can be overridden by sub-classes of the SenseGlove_Detector
- override void FireRemoveEvent (SG_SenseGloveHardware model)
  A step in between events that can be overridden by sub-classes of the SenseGlove_Detector
- override void **Start** ()
- virtual void **Update** ()

Private Member Functions

- void FireHapticFeedback (bool stopAll=false)

  Fire the haptic feedback pulse or loop.

Private Attributes

- int inUse = 0

  The amount of gloves that are using this trigger.
- float buzz_CMD_Time = 1

  If loop is set to true, send a new command every X seconds.
- float buzzTimer = 0

  Used to keep track of new buzz commands.

Additional Inherited Members

5.36.1 Detailed Description

A Detector that, when activated, triggers a series of in-game effects.

5.36.2 Member Function Documentation

5.36.2.1 FireDetectEvent()

```
override void SG.SG_HandTrigger.FireDetectEvent (
            SG_SenseGloveHardware model )  [protected], [virtual]
```

A step in between events that can be overridden by sub-classes of the SenseGlove_Detector

Parameters

model	

Reimplemented from SG.SG_HandDetector.

5.36.2.2 FireHapticFeedback()

```
void SG.SG_HandTrigger.FireHapticFeedback (
            bool stopAll = false )  [private]
```

Fire the haptic feedback pulse or loop.

Parameters

stopAll	

5.36.2.3 FireRemoveEvent()

```
override void SG.SG_HandTrigger.FireRemoveEvent (
            SG_SenseGloveHardware model )  [protected], [virtual]
```

A step in between events that can be overridden by sub-classes of the SenseGlove_Detector

Parameters

model	

Reimplemented from SG.SG_HandDetector.

5.36.2.4 InUse()

```
bool SG.SG_HandTrigger.InUse ( )
```

Check if the trigger is in use by one or more sense gloves.

Returns

5.36.2.5 SetEffectObject()

```
void SG.SG_HandTrigger.SetEffectObject (
            bool active )
```

Enable/disable the "effectToShow" Gameobject

Parameters

active	

5.36.2.6 SetParticles()

```
void SG.SG_HandTrigger.SetParticles (
            bool play )
```

Start / Stop the particleeffect

Parameters

play	

5.36.3 Member Data Documentation

5.36.3.1 audioToPlay

```
AudioSource SG.SG_HandTrigger.audioToPlay
```

(Optional) Audio to play if the glove is detected

5.36.3.2 buzz_CMD_Time

```
float SG.SG_HandTrigger.buzz_CMD_Time = 1  [private]
```

If loop is set to true, send a new command every X seconds.

5.36.3.3 buzzTimer

```
float SG.SG_HandTrigger.buzzTimer = 0  [private]
```

Used to keep track of new buzz commands.

5.36.3.4 effectToShow

```
GameObject SG.SG_HandTrigger.effectToShow
```

(group of) game objects to show when the glove is detected.

5.36.3.5 hapticDuration

```
int SG.SG_HandTrigger.hapticDuration = 200
```

The duration of a haptic feedback pulse.

5.36.3.6 hapticFeedback

```
bool SG.SG_HandTrigger.hapticFeedback = false
```

(Optional) tells the glove to give haptic feedback

5.36.3.7 hapticForce

```
int SG.SG_HandTrigger.hapticForce = 100
```

The magnitude of the haptic Feedback

5.36.3.8 inUse

```
int SG.SG_HandTrigger.inUse = 0  [private]
```

The amount of gloves that are using this trigger.

5.36.3.9 loop

```
bool SG.SG_HandTrigger.loop = false
```

If set to true, the haptic feedback is continuous while the glove is inside the trigger

5.36.3.10 particlesToPlay

```
ParticleSystem SG.SG_HandTrigger.particlesToPlay
```

Particle effects that are shown when the glove is detected

5.36.3.11 whichFingers

```
bool [] SG.SG_HandTrigger.whichFingers = new bool[5] { true, false, false, false, false }
```

Which fingers to apply the Haptic feedback to

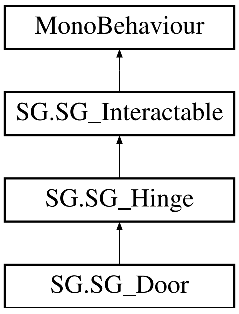
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Controls/SG_Hand↩
  Trigger.cs

5.37 SG.SG_Hinge Class Reference

Represents an Interactable that can rotate around a specified point and axis. Used to extend doors and levers.

Inheritance diagram for SG.SG_Hinge:



Public Member Functions

- override void UpdateInteraction ()

  Update the interaction with this Interactable.
- override void SetInteractable (bool interactable)

  Set this drawer and its handles to active / inactive.
- void SetupHinge ()

  Setup the hinge with the chosen options and verify them.
- void StopPhysicsBody ()

  Stop the hinge body's movement before setting the angle(s)
- void SetAngle (float newAngle, bool freezeBody=false)

  Set the hinge angle to the desired value (in degrees), using its localRotation.
- float GetHingeAngle ()

  Retrieve the local rotation angle of the hingePoint
- float GetHingeAngle (Vector3 absPosition)

  Retrieve the angle that the hinge should face to reach the chosen position.
- float HingeRatio ()

  Retrieve the ratio (0 .. 1) of this Hinge Joint, from minAngle (0) to maxAngle (1). Used for events / animations.

Public Attributes

- Transform hingePoint

  The point around which the hinge moves.
- MovementAxis hingeAxis = MovementAxis.Y

  The axis of the hingepoint around which the hinge moves.
- HingeJoint joint

  The (optional) physics-based hingejoint that controls the hinge's movement when not interacting.
- bool autoSetup = true

  Set to true if you want the Sense Glove to be automatically set up. False to stop the SenseGlove from messing with your script(s).
- int minAngle = -180

  The minimum hinge angle, in degrees
- int maxAngle = 180

  The maximum hinge angle, in degrees
- List< SG_GrabZone > handles = new List<SG_GrabZone>()

  The handles connected to this Interactable.

Protected Member Functions

- virtual void **Awake** ()
- virtual void **Start** ()
- virtual void **Update** ()
- virtual void **FixedUpdate** ()
- override bool InteractionBegin (SG_GrabScript grabScript, bool fromExternal=false)

  Begin the interaction with this Interactable
- override bool InteractionEnd (SG_GrabScript grabScript, bool fromExternal=false)

  Ends the interaction between the grabscript and this hinge

Private Member Functions

- float GetAngle (Vector3 absPosition)

  Calculate the angle of an absolute position relative to the hinge [Internal use]
- void CheckLimits ()

  Check if the hinge is still within its working limits.
- Vector3 RotationAxis ()

  Returns the (absolute) rotation axis of this hinge.

Private Attributes

- Rigidbody physicsBody

  The (optional) rigidbody of the hinge that moves it around when not interacting.
- GameObject grabReference

  The reference of the GrabScript that is holding this hinge
- float offsetAngle = 0

  The offset
- bool usedGravity = false

  Whether the hinge used gravity before interaction started.
- bool wasKinematic = true

  Whether the hinge was kinematic fefore any interaction started.

Additional Inherited Members

5.37.1 Detailed Description

Represents an Interactable that can rotate around a specified point and axis. Used to extend doors and levers.

5.37.2 Member Function Documentation

5.37.2.1 CheckLimits()

```
void SG.SG_Hinge.CheckLimits ( )  [private]
```

Check if the hinge is still within its working limits.

5.37.2.2 GetAngle()

```
float SG.SG_Hinge.GetAngle (
             Vector3 absPosition )  [private]
```

Calculate the angle of an absolute position relative to the hinge [Internal use]

Parameters

absPosition	

Returns

5.37.2.3 GetHingeAngle() [1/2]

```
float SG.SG_Hinge.GetHingeAngle ( )
```

Retrieve the local rotation angle of the hingePoint

Returns

5.37.2.4 GetHingeAngle() [2/2]

```
float SG.SG_Hinge.GetHingeAngle (
            Vector3 absPosition )
```

Retrieve the angle that the hinge should face to reach the chosen position.

Parameters

absPosition	

Returns

5.37.2.5 HingeRatio()

```
float SG.SG_Hinge.HingeRatio ( )
```

Retrieve the ratio (0 .. 1) of this Hinge Joint, from minAngle (0) to maxAngle (1). Used for events / animations.

Returns

5.37.2.6 InteractionBegin()

```
override bool SG.SG_Hinge.InteractionBegin (
            SG_GrabScript grabScript,
            bool fromExternal = false )  [protected], [virtual]
```

Begin the interaction with this Interactable

Parameters

grabScript	

Implements SG.SG_Interactable.

5.37.2.7 InteractionEnd()

```
override bool SG.SG_Hinge.InteractionEnd (
            SG_GrabScript grabScript,
            bool fromExternal = false )  [protected], [virtual]
```

Ends the interaction between the grabscript and this hinge

Parameters

grabScript	

Implements SG.SG_Interactable.

5.37.2.8 RotationAxis()

```
Vector3 SG.SG_Hinge.RotationAxis ( )  [private]
```

Returns the (absolute) rotation axis of this hinge.

Returns

5.37.2.9 SetAngle()

```
void SG.SG_Hinge.SetAngle (
             float newAngle,
             bool freezeBody = false )
```

Set the hinge angle to the desired value (in degrees), using its localRotation.

Parameters

newAngle	

5.37.2.10 SetInteractable()

```
override void SG.SG_Hinge.SetInteractable (
             bool interactable )  [virtual]
```

Set this drawer and its handles to active / inactive.

Parameters

interactable	

Reimplemented from SG.SG_Interactable.

5.37.2.11 SetupHinge()

```
void SG.SG_Hinge.SetupHinge ( )
```

Setup the hinge with the chosen options and verify them.

5.37.2.12 StopPhysicsBody()

```
void SG.SG_Hinge.StopPhysicsBody ( )
```

Stop the hinge body's movement before setting the angle(s)

5.37.2.13 UpdateInteraction()

```
override void SG.SG_Hinge.UpdateInteraction ( )  [virtual]
```

Update the interaction with this Interactable.

Reimplemented from SG.SG_Interactable.

5.37.3 Member Data Documentation

5.37.3.1 autoSetup

```
bool SG.SG_Hinge.autoSetup = true
```

Set to true if you want the Sense Glove to be automatically set up. False to stop the SenseGlove from messing with your script(s).

5.37.3.2 grabReference

```
GameObject SG.SG_Hinge.grabReference  [private]
```

The reference of the GrabScript that is holding this hinge

5.37.3.3 handles

```
List<SG_GrabZone> SG.SG_Hinge.handles = new List<SG_GrabZone>()
```

The handles connected to this Interactable.

5.37.3.4 hingeAxis

```
MovementAxis SG.SG_Hinge.hingeAxis = MovementAxis.Y
```

The axis of the hingepoint around which the hinge moves.

5.37.3.5 hingePoint

```
Transform SG.SG_Hinge.hingePoint
```

The point around which the hinge moves.

5.37.3.6 joint

```
HingeJoint SG.SG_Hinge.joint
```

The (optional) physics-based hingejoint that controls the hinge's movement when not interacting.

5.37.3.7 maxAngle

```
int SG.SG_Hinge.maxAngle = 180
```

The maximum hinge angle, in degrees

5.37.3.8 minAngle

```
int SG.SG_Hinge.minAngle = -180
```

The minimum hinge angle, in degrees

5.37.3.9 offsetAngle

```
float SG.SG_Hinge.offsetAngle = 0  [private]
```

The offset

The offset angle between the grabreference and the hinge (handle)

5.37.3.10 physicsBody

```
Rigidbody SG.SG_Hinge.physicsBody  [private]
```

The (optional) rigidbody of the hinge that moves it around when not interacting.

5.37.3.11 usedGravity

```
bool SG.SG_Hinge.usedGravity = false  [private]
```

Whether the hinge used gravity before interaction started.

5.37.3.12 wasKinematic

```
bool SG.SG_Hinge.wasKinematic = true  [private]
```

Whether the hinge was kinematic fefore any interaction started.

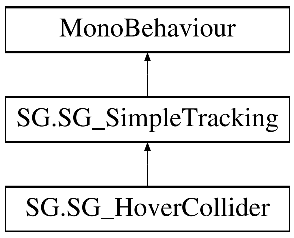
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Interaction/SG_Hinge.cs

5.38 SG.SG_HoverCollider Class Reference

A script that keeps track of multiple SG_Interactable objects it collides with.

Inheritance diagram for SG.SG_HoverCollider:



Public Member Functions

- bool IsTouching ()

  Return treu if this script is touching an object
- bool IsTouching (GameObject obj)

  Returns true if this script is touching a specific GameObject.
- bool IsTouching (SG_Interactable interactable)

  Returns true if this script is touching a specific SG_Interactable.
- SG_Interactable[ ] MatchingObjects (SG_HoverCollider other)

  Returns a list of interactables that are touched by both this hoverCollider and another hoverCollider
- void ClearTouchedObjects ()

  Clear this scripts references to other scripts.

Static Public Member Functions

- static bool GetInteractableScript (Collider col, out SG_Interactable interactable, bool favourSpecific=true)

  Retrieve a SG_Interactable object from a collider. Returns true if one is found.
- static bool SameScript (Collider col, SG_Interactable touchedScript)

  Checks if a collider is connected to a specific touchedScript

Protected Member Functions

- int ListIndex (SG_Interactable iScript)

  Returns the index of an SG_Interactable in this script's touchedObjects.
- void AddToList (SG_Interactable script)

  Add a new (collider of) an SG_Interactable script to this script's touchedObjects
- void RemoveFromList (Collider col)

  Remove a collider from this script's touchedObjects
- override void **Awake** ()
- virtual void **OnTriggerEnter** (Collider other)
- virtual void **OnTriggerExit** (Collider other)

Protected Attributes

- List< SG_Interactable > interactablesTouched = new List<SG_Interactable>()

  The list of interactables that are currently being touched.
- List< int > collidersInside = new List<int>()

  The number of colliders for each interactable that this script is touching.

Properties

- SG_Interactable[ ] TouchedObjects `[get]`

  The interactable objects that this script is currently touching

Additional Inherited Members

5.38.1 Detailed Description

A script that keeps track of multiple SG_Interactable objects it collides with.

5.38.2 Member Function Documentation

5.38.2.1 AddToList()

```
void SG.SG_HoverCollider.AddToList (
            SG_Interactable script )  [protected]
```

Add a new (collider of) an SG_Interactable script to this script's touchedObjects

Parameters

script	

5.38.2.2 ClearTouchedObjects()

```
void SG.SG_HoverCollider.ClearTouchedObjects ( )
```

Clear this scripts references to other scripts.

5.38.2.3 GetInteractableScript()

```
static bool SG.SG_HoverCollider.GetInteractableScript (
            Collider col,
            out SG_Interactable interactable,
            bool favourSpecific = true )  [static]
```

Retrieve a SG_Interactable object from a collider. Returns true if one is found.

Parameters

col	
interactable	
favourSpecific	

Returns

5.38.2.4 IsTouching() [1/3]

```
bool SG.SG_HoverCollider.IsTouching ( )
```

Return treu if this script is touching an object

Returns

5.38.2.5 IsTouching() [2/3]

```
bool SG.SG_HoverCollider.IsTouching (
             GameObject obj )
```

Returns true if this script is touching a specific GameObject.

Parameters

obj	

Returns

5.38.2.6 IsTouching() [3/3]

```
bool SG.SG_HoverCollider.IsTouching (
             SG_Interactable interactable )
```

Returns true if this script is touching a specific SG_Interactable.

Parameters

interactable	

Returns

5.38.2.7 ListIndex()

```
int SG.SG_HoverCollider.ListIndex (
            SG_Interactable iScript ) [protected]
```

Returns the index of an SG_Interactable in this script's touchedObjects.

Parameters

iScript	

Returns

5.38.2.8 MatchingObjects()

```
SG_Interactable [] SG.SG_HoverCollider.MatchingObjects (
            SG_HoverCollider other )
```

Returns a list of interactables that are touched by both this hoverCollider and another hoverCollider

Parameters

other	

Returns

5.38.2.9 RemoveFromList()

```
void SG.SG_HoverCollider.RemoveFromList (
            Collider col ) [protected]
```

Remove a collider from this script's touchedObjects

Parameters

col	

5.38.2.10 SameScript()

```
static bool SG.SG_HoverCollider.SameScript (
            Collider col,
            SG_Interactable touchedScript )  [static]
```

Checks if a collider is connected to a specific touchedScript

Parameters

col	
touchedScript	

Returns

5.38.3 Member Data Documentation

5.38.3.1 collidersInside

```
List<int> SG.SG_HoverCollider.collidersInside = new List<int>()  [protected]
```

The number of colliders for each interactable that this script is touching.

5.38.3.2 interactablesTouched

```
List<SG_Interactable> SG.SG_HoverCollider.interactablesTouched = new List<SG_Interactable>()
[protected]
```

The list of interactables that are currently being touched.

5.38.4 Property Documentation

5.38.4.1 TouchedObjects

```
SG_Interactable [] SG.SG_HoverCollider.TouchedObjects  [get]
```

The interactable objects that this script is currently touching

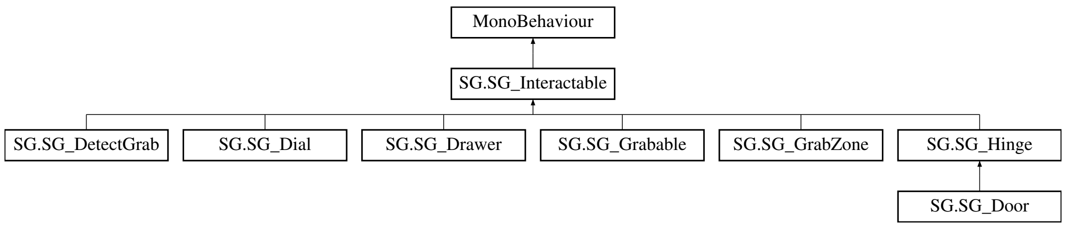
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Grabbing/SG_Hover↩
Collider.cs

5.39 SG.SG_Interactable Class Reference

Represents an object that a SenseGlove Grabscript can interact with. Extended by most of the Interaction scripts.

Inheritance diagram for SG.SG_Interactable:



Public Member Functions

- virtual void SetInteractable (bool canInteract)

    Sets the object to be interactable (or not).
- virtual bool CanInteract ()

    Check if this object can be interacted with at this moment.
- virtual bool WithinBounds ()

    Check if this object is still within acceptable distance of the grabscript.
- virtual bool MustBeReleased ()

    Returns true if this script is not longer active.
- virtual bool EndInteractAllowed ()

    Check if this interactable allows a grabScript to end an interaction.
- bool BeginInteraction (SG_GrabScript grabScript, bool fromExternal=false)

    Begin the interaction between this object and a GrabScript.
- virtual void EndInteraction ()

    (Manually) ends all interaction with this object's GrabScript(s)
- bool EndInteraction (SG_GrabScript grabScript, bool fromExternal=false)

    (Manually) End the interaction with this GrabScript
- virtual void UpdateInteraction ()

    Called by the grabscript after it has updated. Ensures that the FollowObject always updates last.
- void TouchedBy (SG_BasicFeedback touchScript)

    Called by SG_Feedback when it touches an interactable. Informs this Interactable that it is being touched.
- void UnTouchedBy (SG_BasicFeedback touchScript)

    Called by SG_Feedback when it touches an interactable. Informs this Interactable that it is no longer being touched
- virtual void ResetObject ()

    Reset this object to its original state.
- virtual void SaveTransform ()

    Save the current "state" of the interactable, to which it will return when ResetObject is called.
- virtual bool InteractingWith (SG_GrabScript grabScript)

    Check if this Interactable is (already) interacting with a specified grabscript.
- virtual bool IsInteracting ()

    Check if this object is being interacted with.
- delegate void **InteractBeginEventHandler** (object source, SG_InteractArgs args)
- delegate void **InteractEndEventHandler** (object source, SG_InteractArgs args)
- delegate void **ResetEventHandler** (object source, System.EventArgs args)
- delegate void **TouchedEventHandler** (object source, System.EventArgs args)

Public Attributes

- bool fingerThumb = true

  This object can be picked up between a thumb and finger collider.
- bool fingerPalm = true

  This object can be picked up between the palm collider and a finger (including the thumb).
- ReleaseMethod releaseMethod = ReleaseMethod.Default

  Determines special conditions that must be fulfilled to release this object.

Protected Member Functions

- abstract bool InteractionBegin (SG_GrabScript grabScript, bool fromExternal)

  Called when the Interaction begins on this Interactable.
- abstract bool InteractionEnd (SG_GrabScript grabScript, bool fromExternal)

  Called when the Interaction ends on this Interactable.
- int GetTouchIndex (SG_SenseGloveHardware grabScript)

  Get the index
- virtual void **OnInteractBegin** (SG_GrabScript grabScript, bool fromExternal)
- virtual void **OnInteractEnd** (SG_GrabScript grabScript, bool fromExternal)
- void **OnObjectReset** ()
- virtual void **OnTouched** ()
- virtual void **OnUnTouched** ()

Protected Attributes

- bool isInteractable = true

  Indicates if this object can be interacted with at this moment.
- float releaseDistance = 0.10f

  Force then EndInteraction if the handModel ever passes more than this distance (in m) from the original grab location.
- SG_GrabScript _grabScript

  A reference to the GrabScript that is currently interacting with this SenseGlove.
- Vector3 originalPos

  The original (absolute) position of this GameObject, stored on Awake()
- Quaternion originalRot

  The original (absolute) rotation of this GameObject, stored on Awake()
- float originalDist

  The original distance between grabrefrence and my pickupRefrence.
- List< SG_SenseGloveHardware > touchedScripts = new List<SG_SenseGloveHardware>()

  The list of touchScripts that are currently touching this object.
- List< int > touchedColliders = new List<int>()

  The number of colliders of a given grabscript that are touching this Interactable.

Properties

- virtual SG_GrabScript GrabScript `[get]`

  Access the grabscript that is currently interacting with this object.

Events

- InteractBeginEventHandler InteractionBegun

  Fires after this interactable begins an interaction with a specific Grabscript.
- InteractEndEventHandler InteractionEnded

  Fires after this interactable ends an interaction with a specific GrabScript.
- ResetEventHandler ObjectReset

  Fires when this Object is reset to its original position.
- TouchedEventHandler Touched

  Fires when this Interactable is first touched by a Sense Glove_Touch collider.
- TouchedEventHandler UnTouched

  Fires when all colliders have stopped touching this Interactable.

5.39.1 Detailed Description

Represents an object that a SenseGlove Grabscript can interact with. Extended by most of the Interaction scripts.

5.39.2 Member Function Documentation

5.39.2.1 BeginInteraction()

```
bool SG.SG_Interactable.BeginInteraction (
            SG_GrabScript grabScript,
            bool fromExternal = false )
```

Begin the interaction between this object and a GrabScript.

Parameters

grabScript	
fromExternal	

5.39.2.2 CanInteract()

```
virtual bool SG.SG_Interactable.CanInteract ( )  [virtual]
```

Check if this object can be interacted with at this moment.

May be overridden by sub-classes.

Returns

5.39.2.3 EndInteractAllowed()

```
virtual bool SG.SG_Interactable.EndInteractAllowed ( )  [virtual]
```

Check if this interactable allows a grabScript to end an interaction.

Returns

5.39.2.4 EndInteraction() [1/2]

```
virtual void SG.SG_Interactable.EndInteraction ( )  [virtual]
```

(Manually) ends all interaction with this object's GrabScript(s)

5.39.2.5 EndInteraction() [2/2]

```
bool SG.SG_Interactable.EndInteraction (
            SG_GrabScript grabScript,
            bool fromExternal = false )
```

(Manually) End the interaction with this GrabScript

Parameters

fromExternal	
grabScript	

5.39.2.6 GetTouchIndex()

```
int SG.SG_Interactable.GetTouchIndex (
            SG_SenseGloveHardware grabScript )  [protected]
```

Get the index

Parameters

grabScript	

Returns

5.39.2.7 InteractingWith()

```
virtual bool SG.SG_Interactable.InteractingWith (
             SG_GrabScript grabScript )  [virtual]
```

Check if this Interactable is (already) interacting with a specified grabscript.

Parameters

grabScript	

Returns

5.39.2.8 InteractionBegin()

```
abstract bool SG.SG_Interactable.InteractionBegin (
             SG_GrabScript grabScript,
             bool fromExternal )  [protected], [pure virtual]
```

Called when the Interaction begins on this Interactable.

Parameters

grabScript	
fromExternal	

Returns

True if a succesfull connection has been established.

Implemented in SG.SG_Drawer, SG.SG_Hinge, SG.SG_Grabable, SG.SG_GrabZone, SG.SG_Dial, and SG.SG_DetectGrab.

5.39.2.9 InteractionEnd()

```
abstract bool SG.SG_Interactable.InteractionEnd (
             SG_GrabScript grabScript,
             bool fromExternal )  [protected], [pure virtual]
```

Called when the Interaction ends on this Interactable.

Parameters

grabScript	
fromExternal	

Returns

True if the interaction has been ended.

Implemented in SG.SG_Grabable, SG.SG_Hinge, SG.SG_Drawer, SG.SG_GrabZone, SG.SG_Dial, and SG.SG_DetectGrab.

5.39.2.10 IsInteracting()

```
virtual bool SG.SG_Interactable.IsInteracting ( )  [virtual]
```

Check if this object is being interacted with.

Returns

5.39.2.11 MustBeReleased()

```
virtual bool SG.SG_Interactable.MustBeReleased ( )  [virtual]
```

Returns true if this script is not longer active.

Returns

5.39.2.12 ResetObject()

```
virtual void SG.SG_Interactable.ResetObject ( )  [virtual]
```

Reset this object to its original state.

Reimplemented in SG.SG_Drawer, SG.SG_Grabable, and SG.SG_GrabZone.

5.39.2.13 SaveTransform()

```
virtual void SG.SG_Interactable.SaveTransform ( )  [virtual]
```

Save the current "state" of the interactable, to which it will return when ResetObject is called.

Reimplemented in SG.SG_Drawer, SG.SG_Grabable, and SG.SG_GrabZone.

5.39.2.14 SetInteractable()

```
virtual void SG.SG_Interactable.SetInteractable (
             bool canInteract )  [virtual]
```

Sets the object to be interactable (or not).

May be overridden by sub-classes.

Parameters

canInteract	

Reimplemented in SG.SG_Hinge, and SG.SG_Drawer.

5.39.2.15 TouchedBy()

```
void SG.SG_Interactable.TouchedBy (
             SG_BasicFeedback touchScript )
```

Called by SG_Feedback when it touches an interactable. Informs this Interactable that it is being touched.

Parameters

touchScript	

5.39.2.16 UnTouchedBy()

```
void SG.SG_Interactable.UnTouchedBy (
             SG_BasicFeedback touchScript )
```

Called by SG_Feedback when it touches an interactable. Informs this Interactable that it is no longer being touched

Parameters

touchScript	

5.39.2.17 UpdateInteraction()

```
virtual void SG.SG_Interactable.UpdateInteraction ( )  [virtual]
```

Called by the grabscript after it has updated. Ensures that the FollowObject always updates last.

Reimplemented in SG.SG_Drawer, SG.SG_Grabable, SG.SG_Hinge, SG.SG_GrabZone, and SG.SG_Dial.

5.39.2.18 WithinBounds()

```
virtual bool SG.SG_Interactable.WithinBounds ( )  [virtual]
```

Check if this object is still within acceptable distance of the grabscript.

5.39.3 Member Data Documentation

5.39.3.1 _grabScript

```
SG_GrabScript SG.SG_Interactable._grabScript  [protected]
```

A reference to the GrabScript that is currently interacting with this SenseGlove.

5.39.3.2 fingerPalm

```
bool SG.SG_Interactable.fingerPalm = true
```

This object can be picked up between the palm collider and a finger (including the thumb).

5.39.3.3 fingerThumb

```
bool SG.SG_Interactable.fingerThumb = true
```

This object can be picked up between a thumb and finger collider.

5.39.3.4 isInteractable

```
bool SG.SG_Interactable.isInteractable = true  [protected]
```

Indicates if this object can be interacted with at this moment.

5.39.3.5 originalDist

```
float SG.SG_Interactable.originalDist  [protected]
```

The original distance between grabrefrence and my pickupRefrence.

5.39.3.6 originalPos

```
Vector3 SG.SG_Interactable.originalPos  [protected]
```

The original (absolute) position of this GameObject, stored on Awake()

5.39.3.7 originalRot

```
Quaternion SG.SG_Interactable.originalRot  [protected]
```

The original (absolute) rotation of this GameObject, stored on Awake()

5.39.3.8 releaseDistance

```
float SG.SG_Interactable.releaseDistance = 0.10f  [protected]
```

Force then EndInteraction if the handModel ever passes more than this distance (in m) from the original grab location.

Mostly relevant for drawers and levers, or other controls that move along a specific path.

5.39.3.9 releaseMethod

```
ReleaseMethod SG.SG_Interactable.releaseMethod = ReleaseMethod.Default
```

Determines special conditions that must be fulfilled to release this object.

5.39.3.10 touchedColliders

```
List<int> SG.SG_Interactable.touchedColliders = new List<int>()  [protected]
```

The number of colliders of a given grabscript that are touching this Interactable.

5.39.3.11 touchedScripts

```
List<SG_SenseGloveHardware> SG.SG_Interactable.touchedScripts = new List<SG_SenseGloveHardware>()
[protected]
```

The list of touchScripts that are currently touching this object.

5.39.4 Property Documentation

5.39.4.1 GrabScript

```
virtual SG_GrabScript SG.SG_Interactable.GrabScript  [get]
```

Access the grabscript that is currently interacting with this object.

Returns

5.39.5 Event Documentation

5.39.5.1 InteractionBegun

```
InteractBeginEventHandler SG.SG_Interactable.InteractionBegun
```

Fires after this interactable begins an interaction with a specific Grabscript.

5.39.5.2 InteractionEnded

```
InteractEndEventHandler SG.SG_Interactable.InteractionEnded
```

Fires after this interactable ends an interaction with a specific GrabScript.

5.39.5.3 ObjectReset

`ResetEventHandler SG.SG_Interactable.ObjectReset`

Fires when this Object is reset to its original position.

5.39.5.4 Touched

`TouchedEventHandler SG.SG_Interactable.Touched`

Fires when this Interactable is first touched by a Sense Glove_Touch collider.

5.39.5.5 UnTouched

`TouchedEventHandler SG.SG_Interactable.UnTouched`

Fires when all colliders have stopped touching this Interactable.

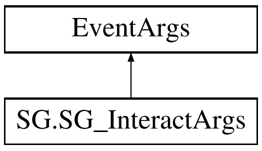
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Interaction/SG_Interactable.↩ cs

5.40 SG.SG_InteractArgs Class Reference

Contains event arguments

Inheritance diagram for SG.SG_InteractArgs:



Public Member Functions

- **SG_InteractArgs** (SG_GrabScript script, bool fromExternal)

Properties

- SG_GrabScript **GrabScript** `[get, private set]`
- bool **Forced** `[get, private set]`

5.40.1 Detailed Description

Contains event arguments

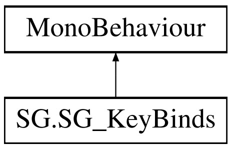
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Interaction/SG_Interactable.↩ cs

5.41 SG.SG_KeyBinds Class Reference

A Keybinds component that can be attached to a TrackedHand so we may access certain functions through buttons or hotkeys.

Inheritance diagram for SG.SG_KeyBinds:



Public Member Functions

- void **LinkScripts** ()
- void **TryCallibrateWrist** ()
- void **TryManualRelease** ()

Public Attributes

- SG_TrackedHand **senseGloveHand**
- KeyCode **calibrateWristKey** = KeyCode.P
- KeyCode **releaseObjectKey** = KeyCode.E

Protected Member Functions

- void **Start** ()
- void **Update** ()

5.41.1 Detailed Description

A Keybinds component that can be attached to a TrackedHand so we may access certain functions through buttons or hotkeys.

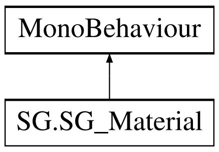
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Util/SG_KeyBinds.cs

5.42 SG.SG_Material Class Reference

A class that contains material properties for a virtual objects, which can be customized, hard-coded or loaded during runtime.

Inheritance diagram for SG.SG_Material:



Public Member Functions

- bool IsBroken ()

  Check if this material is broken
- void UnBreak ()

  Unbreak the material, allowing it to give feedback and raise the break event again.
- int CalculateForce (float displacement, int fingerIndex)

  Calculates the force on the finger based on material properties.
- int CalculateHaptics ()

  Calculate the haptic pulse based on material properties.
- void LoadMaterialProps (SG.Materials.VirtualMaterial ofMaterial)

  Load the hard-coded properties of the material
- delegate void **MaterialBreaksEventHandler** (object source, System.EventArgs args)

Static Public Member Functions

- static int CalculateResponseForce (float disp, int maxForce, float maxForceDist)

  The actual method to calculate things, used by both default and custom materials.

Public Attributes

- SG.Materials.VirtualMaterial material = SG.Materials.VirtualMaterial.Custom

  The material-type of the SenseGlove_Material.
- int maxForce = 100

  The maximum brake force [0..100%] that the material provides at maxForceDist.
- float maxForceDist = 0.00f

  The distance [in m] before the maximum force is reached.
- float yieldDistance = 0.03f

  The distance [in m] before the material calls an OnBreak event.
- bool hapticFeedback = false

  Whether or not the material should give any haptic feedback through the buzzMotors.
- int hapticMagnitude = 100

  The magnitude of the haptic pulse [0..100%]
- int hapticDuration = 100

  (maximum) duration in ms of the haptic pulse
- bool breakable = false

Indicates that this material can raise an OnBreak event.

- bool mustBeGrabbed = false

  this object must first be picked up before it can be broken.

- bool requiresThumb = false

  This object must be crushed by the thumb before it can be broken

- int minimumFingers = 1

  The minimum amount of fingers (not thumb) that 'break' this object before it actually breaks.

Protected Member Functions

- void **OnMaterialBreak** ()
- virtual void **Start** ()
- virtual void OnDisable ()

  Unbreak this material if it is disabled.

Protected Attributes

- SG_MeshDeform deformScript

  (Optional) Connected Material Deformation Script, used to pass deformation paraeters?

Events

- MaterialBreaksEventHandler MaterialBreaks

  Fires when the material breaks under the conditions set through the Material Properties.

Private Member Functions

- void LoadMaterialProps (SG.Materials.MaterialProps props)

  Actually apply materialProps to this Material.

Private Attributes

- bool isBroken = false

  Check whether or not this object is broken.

- SG_Interactable myInteractable

  My (optional) interactable script

- bool[ ] raisedBreak = new bool[5]

  [thumb/palm, index, middle, pinky, ring]

- int brokenBy = 0

  How many fingers [not thumb] have raised break events.

5.42.1 Detailed Description

A class that contains material properties for a virtual objects, which can be customized, hard-coded or loaded during runtime.

5.42.2 Member Function Documentation

5.42.2.1 CalculateForce()

```
int SG.SG_Material.CalculateForce (
            float displacement,
            int fingerIndex )
```

Calculates the force on the finger based on material properties.

Parameters

displacement	
fingerIndex	

Returns

5.42.2.2 CalculateHaptics()

```
int SG.SG_Material.CalculateHaptics ( )
```

Calculate the haptic pulse based on material properties.

Returns

5.42.2.3 CalculateResponseForce()

```
static int SG.SG_Material.CalculateResponseForce (
            float disp,
            int maxForce,
            float maxForceDist )  [static]
```

The actual method to calculate things, used by both default and custom materials.

Returns

5.42.2.4 IsBroken()

```
bool SG.SG_Material.IsBroken ( )
```

Check if this material is broken

Returns

5.42.2.5 LoadMaterialProps() [1/2]

```
void SG.SG_Material.LoadMaterialProps (
            SG.Materials.MaterialProps props )  [private]
```

Actually apply materialProps to this Material.

Parameters

props	

5.42.2.6 LoadMaterialProps() [2/2]

```
void SG.SG_Material.LoadMaterialProps (
            SG.Materials.VirtualMaterial ofMaterial )
```

Load the hard-coded properties of the material

Parameters

ofMaterial	

5.42.2.7 OnDisable()

```
virtual void SG.SG_Material.OnDisable ( )  [protected], [virtual]
```

Unbreak this material if it is disabled.

5.42.2.8 UnBreak()

```
void SG.SG_Material.UnBreak ( )
```

Unbreak the material, allowing it to give feedback and raise the break event again.

5.42.3 Member Data Documentation

5.42.3.1 breakable

```
bool SG.SG_Material.breakable = false
```

Indicates that this material can raise an OnBreak event.

5.42.3.2 brokenBy

```
int SG.SG_Material.brokenBy = 0 [private]
```

How many fingers [not thumb] have raised break events.

5.42.3.3 deformScript

```
SG_MeshDeform SG.SG_Material.deformScript [protected]
```

(Optional) Connected Material Deformation Script, used to pass deformation paraeters?

5.42.3.4 hapticDuration

```
int SG.SG_Material.hapticDuration = 100
```

(maximum) duration in ms of the haptic pulse

5.42.3.5 hapticFeedback

```
bool SG.SG_Material.hapticFeedback = false
```

Whether or not the material should give any haptic feedback through the buzzMotors.

5.42.3.6 hapticMagnitude

```
int SG.SG_Material.hapticMagnitude = 100
```

The magnitude of the haptic pulse [0..100%]

5.42.3.7 isBroken

```
bool SG.SG_Material.isBroken = false  [private]
```

Check whether or not this object is broken.

5.42.3.8 material

```
SG.Materials.VirtualMaterial SG.SG_Material.material = SG.Materials.VirtualMaterial.Custom
```

The material-type of the SenseGlove_Material.

5.42.3.9 maxForce

```
int SG.SG_Material.maxForce = 100
```

The maximum brake force [0..100%] that the material provides at maxForceDist.

5.42.3.10 maxForceDist

```
float SG.SG_Material.maxForceDist = 0.00f
```

The distance [in m] before the maximum force is reached.

5.42.3.11 minimumFingers

```
int SG.SG_Material.minimumFingers = 1
```

The minimum amount of fingers (not thumb) that 'break' this object before it actually breaks.

5.42.3.12 mustBeGrabbed

```
bool SG.SG_Material.mustBeGrabbed = false
```

this object must first be picked up before it can be broken.

5.42.3.13 myInteractable

```
SG_Interactable SG.SG_Material.myInteractable [private]
```

My (optional) interactable script

5.42.3.14 raisedBreak

```
bool [] SG.SG_Material.raisedBreak = new bool[5] [private]
```

[thumb/palm, index, middle, pinky, ring]

5.42.3.15 requiresThumb

```
bool SG.SG_Material.requiresThumb = false
```

This object must be crushed by the thumb before it can be broken

5.42.3.16 yieldDistance

```
float SG.SG_Material.yieldDistance = 0.03f
```

The distance [in m] before the material calls an OnBreak event.

5.42.4 Event Documentation

5.42.4.1 MaterialBreaks

```
MaterialBreaksEventHandler SG.SG_Material.MaterialBreaks
```

Fires when the material breaks under the conditions set through the Material Properties.

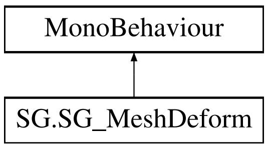
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Feedback/SG_Material.cs

5.43 SG.SG_MeshDeform Class Reference

A class that can hook itself up to a SG_Interactable or material, and deform its mesh.

Inheritance diagram for SG.SG_MeshDeform:



Public Member Functions

- bool SameVertex (Vector3 v1, Vector3 v2)

  Check if one Vertex equals another
- void AddDeformation (Vector3 absEntryVector, Vector3 absDeformPoint, float dist)

  Add a deformation to calculate at the end of the fixedUpdate function.
- void ResetMesh ()

  Reset the points in the mesh to their original vertices.

Public Attributes

- MeshFilter meshFilter

  Will be used to extract the Mesh variable without exposing it to other classes.
- SG.Materials.DisplaceType displaceType = SG.Materials.DisplaceType.Plane

  Determines how the Vertices respond to the collider(s)
- float maxDisplacement = 0.01f

  The Maximum that a vertex can displace from its original position

Protected Member Functions

- void SetDeform (bool meshDeforms)

  Enable / Disable mesh deformation of this script. Default set to true.
- void CollectMeshData ()

  Collect the Mesh Data and find its unique vertices.
- void AddDeform (Vector3 absEntryVector, Vector3 absDeformPoint, float dist)

  Add a single Deformation to the queue
- void RemoveDeform (int index)

  Remove a deformation from the queue
- void ClearDeformations ()

  Clear the list of deforms after everything;s been applied.
- void ResetPoints (bool resetAll)

  Reset all (unique) vertices.
- void DeformMesh (Vector3 absEntryVector, Vector3 absDeformPoint)

  Actually deform the mesh
- void UpdatePoint (int uniqueVertIndex, Vector3 newPos)

  Update a vertex in the uniqueVertices array, and its associated sameVertices.
- void UpdateMesh ()

  Apply all deformation in the Queue
- virtual void **Start** ()
- virtual void **FixedUpdate** ()
- virtual void **OnDisable** ()

Protected Attributes

- Mesh myMesh

  The actual Mesh to manipulate.
- Vector3[ ] verts

  The original vertices of the mesh, used for Deformation Logic
- Vector3[ ] deformVerts

  The deformed mesh vertices, which are used to update the Mesh
- bool atRest = true

  Indicated that the Mesh should be defroming. No need to recalculate unless they are being touched by a Feedback Collider.
- int[ ] uniqueVertices

  The indices (in myMesh.vertices) that represent points that may be shared with others.
- int[ ][ ] sameVertices

  The points shared by the Vertices at each indes of uniqueVertices.
- List< SG.Materials.Deformation > deformationQueue = new List<SG.Materials.Deformation>()

  The queue of deformations that will be aplied during the next update frame.
- bool deforms = true

  Used to enable/disable the mesh deformation.

5.43.1 Detailed Description

A class that can hook itself up to a SG_Interactable or material, and deform its mesh.

5.43.2 Member Function Documentation

5.43.2.1 AddDeform()

```
void SG.SG_MeshDeform.AddDeform (
            Vector3 absEntryVector,
            Vector3 absDeformPoint,
            float dist )  [protected]
```

Add a single Deformation to the queue

Parameters

absEntryVector	
absDeformPoint	
dist	

5.43.2.2 AddDeformation()

```
void SG.SG_MeshDeform.AddDeformation (
            Vector3 absEntryVector,
            Vector3 absDeformPoint,
            float dist )
```

Add a deformation to calculate at the end of the fixedUpdate function.

Parameters

absEntryVector	
absDeformPoint	

5.43.2.3 ClearDeformations()

```
void SG.SG_MeshDeform.ClearDeformations ( )  [protected]
```

Clear the list of deforms after everything;s been applied.

5.43.2.4 CollectMeshData()

```
void SG.SG_MeshDeform.CollectMeshData ( )  [protected]
```

Collect the Mesh Data and find its unique vertices.

Placed in a separate function so one can re-analyze the mesh data on the fly.

5.43.2.5 DeformMesh()

```
void SG.SG_MeshDeform.DeformMesh (
            Vector3 absEntryVector,
            Vector3 absDeformPoint )  [protected]
```

Actually deform the mesh

Parameters

absEntryVector	
absDeformPoint	

5.43.2.6 RemoveDeform()

```
void SG.SG_MeshDeform.RemoveDeform (
            int index )  [protected]
```

Remove a deformation from the queue

Parameters

index	

5.43.2.7 ResetMesh()

```
void SG.SG_MeshDeform.ResetMesh ( )
```

Reset the points in the mesh to their original vertices.

5.43.2.8 ResetPoints()

```
void SG.SG_MeshDeform.ResetPoints (
            bool resetAll )  [protected]
```

Reset all (unique) vertices.

Parameters

resetAll	Set to true to reset all points, set to false to reset only the uniqueVertices (saves time)

5.43.2.9 SameVertex()

```
bool SG.SG_MeshDeform.SameVertex (
            Vector3 v1,
            Vector3 v2 )
```

Check if one Vertex equals another

Parameters

v1	
v2	

Returns

5.43.2.10 SetDeform()

```
void SG.SG_MeshDeform.SetDeform (
            bool meshDeforms )  [protected]
```

Enable / Disable mesh deformation of this script. Default set to true.

Parameters

meshDeforms	

5.43.2.11 UpdateMesh()

```
void SG.SG_MeshDeform.UpdateMesh ( )  [protected]
```

Apply all deformation in the Queue

5.43.2.12 UpdatePoint()

```
void SG.SG_MeshDeform.UpdatePoint (
            int uniqueVertIndex,
            Vector3 newPos )  [protected]
```

Update a vertex in the uniqueVertices array, and its associated sameVertices.

Parameters

i	
newPos	

5.43.3 Member Data Documentation

5.43.3.1 atRest

```
bool SG.SG_MeshDeform.atRest = true  [protected]
```

Indicated that the Mesh should be defroming. No need to recalculate unless they are being touched by a Feedback Collider.

5.43.3.2 deformationQueue

```
List<SG.Materials.Deformation> SG.SG_MeshDeform.deformationQueue = new List<SG.Materials.Deformation>()
[protected]
```

The queue of deformations that will be aplied during the next update frame.

5.43.3.3 deforms

```
bool SG.SG_MeshDeform.deforms = true  [protected]
```

Used to enable/disable the mesh deformation.

5.43.3.4 deformVerts

```
Vector3 [ ] SG.SG_MeshDeform.deformVerts  [protected]
```

The deformed mesh vertices, which are used to update the Mesh

5.43.3.5 displaceType

```
SG.Materials.DisplaceType SG.SG_MeshDeform.displaceType = SG.Materials.DisplaceType.Plane
```

Determines how the Vertices respond to the collider(s)

5.43.3.6 maxDisplacement

```
float SG.SG_MeshDeform.maxDisplacement = 0.01f
```

The Maximum that a vertex can displace from its original position

5.43.3.7 meshFilter

```
MeshFilter SG.SG_MeshDeform.meshFilter
```

Will be used to extract the Mesh variable without exposing it to other classes.

If no Mesh Filter is assigned via the inspector, the script will attempt to retrieve one from the GameObject it is attached to.

5.43.3.8 myMesh

```
Mesh SG.SG_MeshDeform.myMesh  [protected]
```

The actual Mesh to manipulate.

5.43.3.9 sameVertices

```
int [ ][ ] SG.SG_MeshDeform.sameVertices  [protected]
```

The points shared by the Vertices at each indes of uniqueVertices.

5.43.3.10 uniqueVertices

```
int [ ] SG.SG_MeshDeform.uniqueVertices  [protected]
```

The indices (in myMesh.vertices) that represent points that may be shared with others.

5.43.3.11 verts

```
Vector3 [ ] SG.SG_MeshDeform.verts  [protected]
```

The original vertices of the mesh, used for Deformation Logic

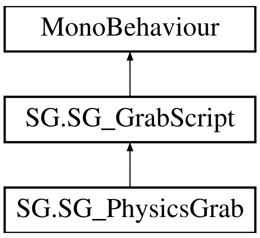
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Feedback/SG_Mesh↩ Deform.cs

5.44 SG.SG_PhysicsGrab Class Reference

A simplified version of the original SenseGlove_PhysGrab script; If an object is touched by finger-thumb or by palm-finger

Inheritance diagram for SG.SG_PhysicsGrab:



Public Member Functions

- override bool CanInteract ()

  Retruns true if this GrabScript is ready to grab objects
- override bool IsTouching ()

  Returns true if one of the fingers is touching an object
- override bool Setup ()

  Called by SG_GrabScript. Assign required variables
- override void CheckForScripts ()

  Setup and check for connected scripts
- override void UpdateGrabScript ()

  Grab new objects and release objects taht are no longer touched.
- SG_Interactable[ ] GetMatching (int finger1, int finger2)

  Returns all grabables that both fingers are touching
- SG_Interactable[ ] GetMatching (int finger1, SG_HoverCollider touch)

  Returns all grabables that both fingers are touchign
- void CheckGestures ()

  Updates grab gestures specific to this script.
- List< SG_Interactable > GetGrabables ()

  Returns a list of all Grabables that this script should be touching at this moment

Static Public Member Functions

- static bool IsInside (SG_Interactable heldObject, List< SG_Interactable > objectsToGrab)

  Returns true if an SG_Interactable is inside a list of other SG_Interactables

Public Attributes

- SG_HandModelInfo handModel

  The Hand Model info to which to link this script's colliders. If left unassigned, one needs to assign tracking to the colliders manually.
- SG_HoverCollider palmTouch

  The Hand Palm collider, used when grabbing objects between the palm and finger (tool/handle grips)
- SG_HoverCollider thumbTouch

  Thumb collider, used to determine finger/thumb collision
- SG_HoverCollider indexTouch

  Index collider, used to determine finger/thumb and finger/palm collision
- SG_HoverCollider middleTouch

  Index collider, used to determine finger/thumb and finger/palm collision

Protected Member Functions

- override bool CanRelease (SG_Interactable obj)

  Returns true if this grabscript can release an object
- override void **Awake** ()

Protected Attributes

- bool[ ] wantsGrab = new bool[3]

    Keeps track of the 'grabbing' pose of fingers
- SG_HoverCollider[ ] touchScripts = new SG_HoverCollider[0]

    The touchscript collection that is easier to iterate through.

Static Protected Attributes

- static float[ ] openHandThresholds = new float[5] { -20, -20, -20, -20, -90 }

    Above these flexions, the hand is considered 'open'
- static float[ ] closedHandThresholds = new float[5] { -360, -360, -360, -360, -360 }

    below these flexions, the hand is considered 'open'

Properties

- override bool DebugEnabled `[set]`

    Show / Hide the hover colliders of this script.

Additional Inherited Members

5.44.1 Detailed Description

A simplified version of the original SenseGlove_PhysGrab script; If an object is touched by finger-thumb or by palm-finger

5.44.2 Member Function Documentation

5.44.2.1 CanInteract()

```
override bool SG.SG_PhysicsGrab.CanInteract ( )  [virtual]
```

Retruns true if this GrabScript is ready to grab objects

Returns

Implements SG.SG_GrabScript.

5.44.2.2 CanRelease()

```
override bool SG.SG_PhysicsGrab.CanRelease (
             SG_Interactable obj )  [protected], [virtual]
```

Returns true if this grabscript can release an object

Parameters

obj	

Returns

Reimplemented from SG.SG_GrabScript.

5.44.2.3 CheckForScripts()

```
override void SG.SG_PhysicsGrab.CheckForScripts ( )  [virtual]
```

Setup and check for connected scripts

Reimplemented from SG.SG_GrabScript.

5.44.2.4 CheckGestures()

```
void SG.SG_PhysicsGrab.CheckGestures ( )
```

Updates grab gestures specific to this script.

5.44.2.5 GetGrabables()

```
List<SG_Interactable> SG.SG_PhysicsGrab.GetGrabables ( )
```

Returns a list of all Grabables that this script should be touching at this moment

Returns

5.44.2.6 GetMatching() [1/2]

```
SG_Interactable [] SG.SG_PhysicsGrab.GetMatching (
             int finger1,
             int finger2 )
```

Returns all grabables that both fingers are touching

Parameters

finger1	
finger2	

Returns

5.44.2.7 GetMatching() [2/2]

```
SG_Interactable [] SG.SG_PhysicsGrab.GetMatching (
             int finger1,
             SG_HoverCollider touch )
```

Returns all grabables that both fingers are touchign

Parameters

finger1	
finger2	

Returns

5.44.2.8 IsInside()

```
static bool SG.SG_PhysicsGrab.IsInside (
             SG_Interactable heldObject,
             List< SG_Interactable > objectsToGrab )  [static]
```

Returns true if an SG_Interactable is inside a list of other SG_Interactables

Parameters

heldObject	
objectsToGrab	

Returns

5.44.2.9 IsTouching()

```
override bool SG.SG_PhysicsGrab.IsTouching ( )  [virtual]
```

Returns true if one of the fingers is touching an object

Returns

Implements SG.SG_GrabScript.

5.44.2.10 Setup()

```
override bool SG.SG_PhysicsGrab.Setup ( )  [virtual]
```

Called by SG_GrabScript. Assign required variables

Returns

Implements SG.SG_GrabScript.

5.44.2.11 UpdateGrabScript()

```
override void SG.SG_PhysicsGrab.UpdateGrabScript ( )  [virtual]
```

Grab new objects and release objects taht are no longer touched.

Implements SG.SG_GrabScript.

5.44.3 Member Data Documentation

5.44.3.1 closedHandThresholds

```
float [] SG.SG_PhysicsGrab.closedHandThresholds = new float[5] { -360, -360, -360, -360, -360
}  [static], [protected]
```

below these flexions, the hand is considered 'open'

5.44.3.2 handModel

`SG_HandModelInfo SG.SG_PhysicsGrab.handModel`

The Hand Model info to which to link this script's colliders. If left unassigned, one needs to assign tracking to the colliders manually.

5.44.3.3 indexTouch

`SG_HoverCollider SG.SG_PhysicsGrab.indexTouch`

Index collider, used to determine finger/thumb and finger/palm collision

5.44.3.4 middleTouch

`SG_HoverCollider SG.SG_PhysicsGrab.middleTouch`

Index collider, used to determine finger/thumb and finger/palm collision

5.44.3.5 openHandThresholds

`float [] SG.SG_PhysicsGrab.openHandThresholds = new float[5] { -20, -20, -20, -20, -90 } [static], [protected]`

Above these flexions, the hand is considered 'open'

5.44.3.6 palmTouch

`SG_HoverCollider SG.SG_PhysicsGrab.palmTouch`

The Hand Palm collider, used when grabbing objects between the palm and finger (tool/handle grips)

5.44.3.7 thumbTouch

`SG_HoverCollider SG.SG_PhysicsGrab.thumbTouch`

Thumb collider, used to determine finger/thumb collision

5.44.3.8 touchScripts

```
SG_HoverCollider [] SG.SG_PhysicsGrab.touchScripts = new SG_HoverCollider[0]  [protected]
```

The touchscript collection that is easier to iterate through.

5.44.3.9 wantsGrab

```
bool [] SG.SG_PhysicsGrab.wantsGrab = new bool[3]  [protected]
```

Keeps track of the 'grabbing' pose of fingers

5.44.4 Property Documentation

5.44.4.1 DebugEnabled

```
override bool SG.SG_PhysicsGrab.DebugEnabled  [set]
```

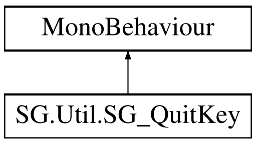
Show / Hide the hover colliders of this script.

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Grabbing/SG_Physics↩ Grab.cs

5.45 SG.Util.SG_QuitKey Class Reference

Inheritance diagram for SG.Util.SG_QuitKey:



Public Member Functions

- void **Quit** ()
- void **ResetScene** ()

Public Attributes

- KeyCode **exitKey** = KeyCode.None
- KeyCode **resetKey** = KeyCode.None

Private Member Functions

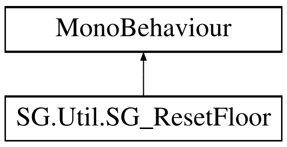
- void **Update** ()

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Util/SG_QuitKey.cs

5.46 SG.Util.SG_ResetFloor Class Reference

Inheritance diagram for SG.Util.SG_ResetFloor:



Public Attributes

- string **resetTag** = "resetable"
- bool **resetEnabled** = true

Protected Member Functions

- void **CheckReset** (Collider other)

Private Member Functions

- void **Start** ()
- void **OnTriggerEnter** (Collider other)
- void **OnTriggerStay** (Collider other)

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Util/SG_ResetFloor.cs

5.47 SG.SG_SenseGloveData Class Reference

Unity wrapper for the GloveData, which contains all a developer will need.

Public Member Functions

- SG_SenseGloveData (SenseGloveCs.GloveData data)

  Extract right-handed coordinate system data from the SenseGlove DLL and convert it into Unity values.
- void UpdateVariables (SenseGloveCs.GloveData data)

  Updates all variables that can change during the simulation.
- void **SetEmpty** ()
- Vector3[ ] TotalGloveAngles ()

  Retrieve the total glove angles, used for gesture recognition (for each finger; pronation, abduction, flexion).
- float[ ] **GetFlexions** ()
- float[ ][ ] GetFingerLengths ()

  Retrieve the finger lengths of this GloveData
- Vector3[ ] GetJointPositions ()

  Retrieve the joint positions

Public Attributes

- bool dataLoaded = false

  Determines if the glove-specific data has been loaded yet.
- GloveSide gloveSide

  Check whether or not this is a left-handed or right-handed glove.
- string deviceID

  The unique ID of this SenseGlove.
- string gloveVersion

  The hardware version of this SenseGlove.
- float firmwareVersion

  The version of the firmware that runs on this SenseGlove's Microcontroller
- float[ ][ ] gloveValues

  The angles between glove segments, as calculated by the firmware. Sorted by finger, from proximal to distal.
- int numberOfSensors

  Teh number of sensors on this Sense Glove.
- float[ ] imuValues

  The raw x y z w values of the IMU within the SenseGlove.
- int[ ] imuCalibration

  The IMU Calibration values for System, Gyro-, Accelero- and Magnetometer. These vary from -1 (N/A) and from 0 (not calibrated) to 3 (fully calibrated)
- int packetsPerSecond = 0

  The amount of sensor packets the senseglove is sending to your system.
- Vector3 commonOriginPos

  The position in mm of the common origin of the Hand and Glove, relative to the wrist.
- Quaternion commonOriginRot

  The orientation of the common origin of the Hand and Glove, relative to the wrist.
- Vector3[ ][ ] gloveAngles

  The euler angles between glove sections relative to its previous section, sorted by finger, from proximal to distal.
- Vector3[ ][ ] gloveLengths

  The lengths of each glove section, sorted by finger, from proximal to distal.
- Vector3[ ][ ] glovePositions

  The positions of the glove joints and thimble in mm, relative to the common origin. Sorted by finger, from proximal to distal.
- Quaternion[ ][ ] gloveRotations

The orientation of the glove joints and thimble, relative to the common origin. Sorted by finger, from proximal to distal.

- Vector3[ ][ ] handAngles

  The euler angles [pronation/supination, abduction/adduction, flexion/extension] between finger joints relative to the previous bone, Sorted by finger, from proximal to distal.
- Vector3[ ][ ] handLengths

  The lengths, in mm, of the finger phalanges. Sorted by finger, from proximal to distal.
- Vector3[ ][ ] handPositions

  The positions of the hand joints fingertips, in mm, relative to the common origin. Sorted by finger, from proximal to distal.
- Quaternion[ ][ ] handRotations

  The orientation of the hand joints and fingertips, relative to the common origin. Sorted by finger, from proximal to distal.
- Quaternion absoluteWrist

  The absolute IMU orientation of the wrist.
- Quaternion relativeWrist

  The wrist orientation relative to the foreArm.
- Quaternion absoluteCalibratedWrist

  The absolute wrist angles, corrected with foreArm calibration.
- int calibrationStep = -1

  The current step of the calibration algorithm.
- int totalCalibrationSteps = 0

  The total number of steps of the calibration algorithm.

Protected Member Functions

- SG_SenseGloveData ()

  Create an instance of SG_SenseGloveData with default values.

Static Protected Member Functions

- static GloveSide GetSide (bool isRight)

  Retrieve the Glove Side of this Sense Glove.
- static void GetChainVariables (ref SenseGloveCs.Kinematics.JointChain[ ] chains, ref Vector3[ ][ ] positions, ref Vector3[ ][ ] angles, ref Quaternion[ ][ ] rotations, ref Vector3[ ][ ] lengths)

  Fill a number of arrays with data from a single kinematic chain.
- static void GetLinkVariables (ref SenseGloveCs.Kinematics.JointChain chain, ref Vector3[ ] positions, ref Vector3[ ] angles, ref Quaternion[ ] rotations, ref Vector3[ ] lengths)

  Fill the appropriate unity Quaternion and Vector3 arrays based on a single joing chain (finger or glove semgent)

Properties

- static SG_SenseGloveData Empty `[get]`

  Retrieve an unloaded set of data, which indictates that this glove has not been loaded yet.

5.47.1 Detailed Description

Unity wrapper for the GloveData, which contains all a developer will need.

5.47.2 Constructor & Destructor Documentation

5.47.2.1 SG_SenseGloveData() [1/2]

```
SG.SG_SenseGloveData.SG_SenseGloveData ( )  [protected]
```

Create an instance of SG_SenseGloveData with default values.

5.47.2.2 SG_SenseGloveData() [2/2]

```
SG.SG_SenseGloveData.SG_SenseGloveData (
             SenseGloveCs.GloveData data )
```

Extract right-handed coordinate system data from the SenseGlove DLL and convert it into Unity values.

Parameters

data	
packets	
totalCSteps	
currCStep	

5.47.3 Member Function Documentation

5.47.3.1 GetChainVariables()

```
static void SG.SG_SenseGloveData.GetChainVariables (
             ref SenseGloveCs.Kinematics.JointChain[ ] chains,
             ref Vector3 positions[ ][ ],
             ref Vector3 angles[ ][ ],
             ref Quaternion rotations[ ][ ],
             ref Vector3 lengths[ ][ ] )  [static], [protected]
```

Fill a number of arrays with data from a single kinematic chain.

Parameters

chains	
positions	
angles	
rotations	
lengths	

5.47.3.2 GetFingerLengths()

```
float [][] SG.SG_SenseGloveData.GetFingerLengths ( )
```

Retrieve the finger lengths of this GloveData

Returns

5.47.3.3 GetJointPositions()

```
Vector3 [] SG.SG_SenseGloveData.GetJointPositions ( )
```

Retrieve the joint positions

Returns

5.47.3.4 GetLinkVariables()

```
static void SG.SG_SenseGloveData.GetLinkVariables (
            ref SenseGloveCs.Kinematics.JointChain chain,
            ref Vector3[] positions,
            ref Vector3[] angles,
            ref Quaternion[] rotations,
            ref Vector3[] lengths )  [static], [protected]
```

Fill the appropriate unity Quaternion and Vector3 arrays based on a single joing chain (finger or glove semgent)

Parameters

chain	
positions	
angles	
rotations	
lengths	

5.47.3.5 GetSide()

```
static GloveSide SG.SG_SenseGloveData.GetSide (
            bool isRight )  [static], [protected]
```

Retrieve the Glove Side of this Sense Glove.

Parameters

isRight	

Returns

5.47.3.6 TotalGloveAngles()

```
Vector3 [] SG.SG_SenseGloveData.TotalGloveAngles ( )
```

Retrieve the total glove angles, used for gesture recognition (for each finger; pronation, abduction, flexion).

Returns

5.47.3.7 UpdateVariables()

```
void SG.SG_SenseGloveData.UpdateVariables (
            SenseGloveCs.GloveData data )
```

Updates all variables that can change during the simulation.

Parameters

data	

5.47.4 Member Data Documentation

5.47.4.1 absoluteCalibratedWrist

```
Quaternion SG.SG_SenseGloveData.absoluteCalibratedWrist
```

The absolute wrist angles, corrected with foreArm calibration.

5.47.4.2 absoluteWrist

```
Quaternion SG.SG_SenseGloveData.absoluteWrist
```

The absolute IMU orientation of the wrist.

5.47.4.3 calibrationStep

```
int SG.SG_SenseGloveData.calibrationStep = -1
```

The current step of the calibration algorithm.

5.47.4.4 commonOriginPos

```
Vector3 SG.SG_SenseGloveData.commonOriginPos
```

The position in mm of the common origin of the Hand and Glove, relative to the wrist.

5.47.4.5 commonOriginRot

```
Quaternion SG.SG_SenseGloveData.commonOriginRot
```

The orientation of the common origin of the Hand and Glove, relative to the wrist.

5.47.4.6 dataLoaded

```
bool SG.SG_SenseGloveData.dataLoaded = false
```

Determines if the glove-specific data has been loaded yet.

5.47.4.7 deviceID

```
string SG.SG_SenseGloveData.deviceID
```

The unique ID of this SenseGlove.

5.47.4.8 firmwareVersion

```
float SG.SG_SenseGloveData.firmwareVersion
```

The version of the firmware that runs on this SenseGlove's Microcontroller

5.47.4.9 gloveAngles

```
Vector3 [][] SG.SG_SenseGloveData.gloveAngles
```

The euler angles between glove sections relative to its previous section, sorted by finger, from proximal to distal.

5.47.4.10 gloveLengths

```
Vector3 [][] SG.SG_SenseGloveData.gloveLengths
```

The lengths of each glove section, sorted by finger, from proximal to distal.

5.47.4.11 glovePositions

```
Vector3 [][] SG.SG_SenseGloveData.glovePositions
```

The positions of the glove joints and thimble in mm, relative to the common origin. Sorted by finger, from proximal to distal.

5.47.4.12 gloveRotations

```
Quaternion [][] SG.SG_SenseGloveData.gloveRotations
```

The orientation of the glove joints and thimble, relative to the common origin. Sorted by finger, from proximal to distal.

5.47.4.13 gloveSide

```
GloveSide SG.SG_SenseGloveData.gloveSide
```

Check whether or not this is a left-handed or right-handed glove.

5.47.4.14 gloveValues

```
float [ ][ ] SG.SG_SenseGloveData.gloveValues
```

The angles between glove segments, as calculated by the firmware. Sorted by finger, from proximal to distal.

5.47.4.15 gloveVersion

```
string SG.SG_SenseGloveData.gloveVersion
```

The hardware version of this SenseGlove.

5.47.4.16 handAngles

```
Vector3 [ ][ ] SG.SG_SenseGloveData.handAngles
```

The euler angles [pronation/supination, abduction/adduction, flexion/extension] between finger joints relative to the previous bone, Sorted by finger, from proximal to distal.

5.47.4.17 handLengths

```
Vector3 [ ][ ] SG.SG_SenseGloveData.handLengths
```

The lengths, in mm, of the finger phalanges. Sorted by finger, from proximal to distal.

5.47.4.18 handPositions

```
Vector3 [ ][ ] SG.SG_SenseGloveData.handPositions
```

The positions of the hand joints fingertips, in mm, relative to the common origin. Sorted by finger, from proximal to distal.

5.47.4.19 handRotations

```
Quaternion [ ][ ] SG.SG_SenseGloveData.handRotations
```

The orientation of the hand joints and fingertips, relative to the common origin. Sorted by finger, from proximal to distal.

5.47.4.20 imuCalibration

```
int [ ] SG.SG_SenseGloveData.imuCalibration
```

The IMU Calibration values for System, Gyro-, Accelero- and Magnetometer. These vary from -1 (N/A) and from 0 (not calibrated) to 3 (fully calibrated)

5.47.4.21 imuValues

```
float [ ] SG.SG_SenseGloveData.imuValues
```

The raw x y z w values of the IMU within the SenseGlove.

5.47.4.22 numberOfSensors

```
int SG.SG_SenseGloveData.numberOfSensors
```

Teh number of sensors on this Sense Glove.

5.47.4.23 packetsPerSecond

```
int SG.SG_SenseGloveData.packetsPerSecond = 0
```

The amount of sensor packets the senseglove is sending to your system.

5.47.4.24 relativeWrist

```
Quaternion SG.SG_SenseGloveData.relativeWrist
```

The wrist orientation relative to the foreArm.

5.47.4.25 totalCalibrationSteps

```
int SG.SG_SenseGloveData.totalCalibrationSteps = 0
```

The total number of steps of the calibration algorithm.

5.47.5 Property Documentation

5.47.5.1 Empty

`SG_SenseGloveData SG.SG_SenseGloveData.Empty [static], [get]`

Retrieve an unloaded set of data, which indictates that this glove has not been loaded yet.

Allows access to the empty Constructor without exposing it.

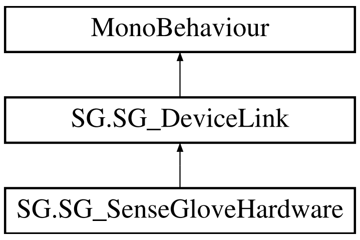
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Devices/SG_SenseGlove↩ Data.cs

5.48 SG.SG_SenseGloveHardware Class Reference

After being linked to a proper Sense Glove via the SenseGlove_DeviceManager, this script is responsible for updating SG_SenseGloveData every frame, and for exposing feedback - and calibration methods.

Inheritance diagram for SG.SG_SenseGloveHardware:



Classes

- class BuzzCmd
- class GloveCalibrationArgs

    CalibrationArguments, containing both old an new finger lengths and joint positions.

Public Types

- enum ConnectionMethod { ConnectionMethod.NextGlove = 0, ConnectionMethod.NextRightHand, ConnectionMethod.NextLeftHand }

    The way this object connects to SenseGlove_Objects detected on this system.
- enum **HapticSendMode** { **OnChange**, **OnFrame**, **Off**, **OnChangeRepeat** }

Public Member Functions

- delegate void GloveEventHandler (object source, System.EventArgs args)

  Event delegate for the glove events event.
- delegate void CalibrationFinishedEventHandler (object source, GloveCalibrationArgs args)

  Event delegate function for the CalibrateionFinished event.
- bool HasFunction (GloveFunctions function)

  Verify if this SenseGlove has a particular functionality (buzz motors, haptic feedback, etc)
- bool StopFeedback ()

  Stop all forms of feedback on this Sense Glove.
- bool SendBrakeCmd (int[ ] commands)

  Send motor commands to the Sense Glove. summary>

Parameters

commands	

Returns

- bool SendBrakeCmd (int thumbCmd, int indexCmd, int middleCmd, int ringCmd, int pinkyCmd)

  Tell the Sense Glove to set its brakes at the desired magnitude [0..100%] for each finger until it recieves a new command.
- bool StopBrakes ()

  Release all brakes of the SenseGlove.
- bool SendBuzzCmd (bool[ ] fingers, int[ ] durations=null, int[ ] magnitudes=null, BuzzMotorPattern[ ] patterns=null)

  Send a buzz-motor command to the Sense Glove, with optional parameters for each finger.
- bool SendBuzzCmd (bool[ ] fingers, int magnitude=100, int duration=400, BuzzMotorPattern pattern=Buzz←MotorPattern.Constant)

  Send one buzzmotor command to specific fingers, as indicated by the fingers array.
- bool SendBuzzCmd (int[ ] magnitudes, int duration)

  Tell the Buzz motors to each vibrate on a different magnitude (0..100%) for a specific duration (ms)
- bool SendBuzzCmd (Finger finger, int magnitude, int duration, BuzzMotorPattern pattern=BuzzMotor←Pattern.Constant)

  Send a buzzmotor command to a specific finger.
- bool StopBuzzMotors ()

  Stop all vibration feedback on the Sense Glove.
- bool SendThumperCmd (SenseGloveCs.ThumperEffect effect)

  Play an effect using the Thumper module on this glove (if it has any).
- void SetHandParameters (Vector3[ ] jointPositions, Vector3[ ][ ] handLengths)

  Apply hand parameters to the Sense Glove internal model.
- void ResetKinematics ()

  Reset the internal handmodel back to the default finger lengths and -positions
- void **SaveHandCalibration** ()
- bool **GetInterpolationProfile** (out SenseGloveCs.Kinematics.InterpolationSet_IMU set)
- bool **SetInterpolationProfile** (SenseGloveCs.Kinematics.InterpolationSet_IMU set)

Static Public Member Functions

- static bool MatchesConnection (bool rightHand, ConnectionMethod method)

  Check whether or not a glove with a particular handed-ness mathces a connection method.

Public Attributes

- ConnectionMethod connectionMethod = ConnectionMethod.NextGlove

  The way with which the SG_SenseGloveHardware connects to a glove.
- bool **FFB_Enabled** = true
- bool buzz_Enabled = true
- SGEvent OnGloveLoad

  Unity Even that fires when this script is assigned to a Sense Glove

Static Public Attributes

- static bool deviceScannerPresent = false

  Saves setup time for multiple SenseGlove_Objects checking for DeviceManager's existance.

Protected Member Functions

- override bool **CanLinkTo** (IODevice device)
- override void SetupDevice ()

  When linked, this function is run for first time setup.
- override void DisposeDevice ()

  Unlink this glove from the manager.
- void CheckForDeviceManager ()

  Check if a device manager is currently active within the Scene. If not, create an instance to manager our connection(s).
- void UpdateGlove ()

  Updates this glove's data.
- void CheckConnection ()

  Check if we should fire an of the connected events.
- void OnGloveLink ()

  Used to call the GloveLoaded event.
- void OnGloveUnLink ()

  Used to call the GloveLoaded event.
- void OnGloveConnect ()

  Used to call the OnGloveLoaded event.
- void OnGloveDisconnect ()

  Used to call the OnGloveLoaded event.
- void FinishCalibration (GloveCalibrationArgs calibrationArgs)

  Used to call the OnCalibrationFinished event.
- void FlushCmds ()

  Update and flush all commands for this Sense Glove.
- bool **WriteHaptics** (int[ ] brakeLvls, int[ ] buzzLvls, int thumperEffect)
- bool **AlreadySent** (int[ ] cmds, int[ ] lastCmd)
- bool WriteBrakeCmd (int[ ] commands)

  Tell the Sense Glove to set its brakes at the desired magnitude [0..100%] for each finger until it recieves a new command.
- virtual void ReadyCalibration (GloveCalibrationArgs args, bool fromDLL)

  The Calibration of the Sense Glove should be ready to fire.
- virtual void CheckCalibration ()

  Check if we have any CalibrationComplete events queued, then send them.
- virtual void **Start** ()
- virtual void **Update** ()
- virtual void **LateUpdate** ()
- override void **OnDestroy** ()
- virtual void **OnApplicationQuit** ()

Protected Attributes

- bool autoConnect = true

  Allows this Sense Glove_Object to manage its own connection status
- HapticSendMode sendHaptics = HapticSendMode.OnChangeRepeat

  When Haptic Commands are sent to the SenseGlove Hardware.
- Solver solver = Solver.Interpolate4Sensors

  The Solver used to calculate this Sense Glove's hand model each frame.
- bool limitFingers = true

  Whether or not to apply natural limits to the fingers.
- bool updateWrist = true

Whether or not to update the wrist model of the Sense Glove.
- SenseGlove linkedGlove = null

  The Internal Sense Glove object that is linked to this monobehaviour Object
- SG_SenseGloveData linkedGloveData = SG_SenseGloveData.Empty

  The last data from the linked glove.
- List< GloveCalibrationArgs > calibrationArguments = new List<GloveCalibrationArgs>()

  Queued Calibration Command from the fingers, which will fire during Unity's next LateUpdate() (so as to allow acces to transforms)
- bool wasConnected = false

  Whether or not the linked glove was connected the last time we checked.
- List< int[ ]> brakeQueue = new List<int[ ]>()

  Command queue for the brakes, which is flushed at the end of every Update function.
- int **nextThump** = (int)ThumperEffect.None
- int[ ] lastBrakeLvls = new int[5]

  The last sent brake command
- List< BuzzCmd > **buzzQueue** = new List<BuzzCmd>()
- int[ ] **lastBuzzLvls** = new int[5]
- int **lastThump** = (int)ThumperEffect.None
- bool **newLinkMade** = false
- int **cmdsSend** = 0
- int **maxCmdRepeat** = 2

Static Protected Attributes

- static int **maxBrakeCmds** = 10
- static int **maxBuzzCmds** = 20
- static int thumpFFBThreshold = 70

  If the average force-feedback levels are above this threshold, we should not fire Thumper Commands.
- static int **thumpBuzzThreshold** = 70

Properties

- bool IsRight `[get]`

  If true, this Sense Glove is connected to a right hand. Otherwise, it is connected to a left hand.
- bool GloveReady `[get]`

  Determines if this glove is ready and linked to the hardware.
- override bool IsConnected `[get]`

  Check if the Sense Glove is connected.
- SG_SenseGloveData GloveData `[get]`

  Retrieve Unity-Friendly Glove Data from the Sense Glove.
- bool? IsCalibrating `[get]`

  Check if this glove is collection calibration points.
- GloveData **InternalGloveData** `[get]`
- float[ ][ ] FingerLengths `[get, set]`

  The finger lengths used by this sense glove as a 5x3 array, which contains the Proximal-, Medial-, and Distal Phalange lengths for each finger, in that order, in mm.
- Vector3[ ] StartJointPositions `[get, set]`

  The positions of the starting finger joints, the CMC or MCP joints, relative to the glove origin.

Events

- GloveEventHandler GloveLoaded

  Called when this script is assigned a Sense Glove via the SenseGlove_DeviceManager.
- GloveEventHandler GloveUnLoaded

  Called when the SenseGlove_DeviceManager unlinks the Sense Glove from this object.
- CalibrationFinishedEventHandler CalibrationFinished

  Occurs when the finger calibration is finished. Passes the old and new GloveData as arguments.

5.48.1 Detailed Description

After being linked to a proper Sense Glove via the SenseGlove_DeviceManager, this script is responsible for updating SG_SenseGloveData every frame, and for exposing feedback - and calibration methods.

5.48.2 Member Enumeration Documentation

5.48.2.1 ConnectionMethod

```
enum SG.SG_SenseGloveHardware.ConnectionMethod  [strong]
```

The way this object connects to SenseGlove_Objects detected on this system.

Enumerator

NextGlove	Connect to the first unconnected SenseGlove on the system.
NextRightHand	Connect to the first unconnected Right Handed SenseGlove on the system.
NextLeftHand	Connect to the first unconnected Left Handed SenseGlove on the system.

5.48.3 Member Function Documentation

5.48.3.1 CalibrationFinishedEventHandler()

```
delegate void SG.SG_SenseGloveHardware.CalibrationFinishedEventHandler (
             object source,
             GloveCalibrationArgs args )
```

Event delegate function for the CalibrateionFinished event.

Parameters

source	
args	

5.48.3.2 CheckCalibration()

```
virtual void SG.SG_SenseGloveHardware.CheckCalibration ( )  [protected], [virtual]
```

Check if we have any CalibrationComplete events queued, then send them.

Placed indside a seprate method so we can call it during both Update and LateUpdate. Should only be fired from these

5.48.3.3 CheckConnection()

```
void SG.SG_SenseGloveHardware.CheckConnection ( )  [protected]
```

Check if we should fire an of the connected events.

While connection events also fire from the DLL, these are mostly from another worker thread. This is Unity-Safe.

5.48.3.4 CheckForDeviceManager()

```
void SG.SG_SenseGloveHardware.CheckForDeviceManager ( )  [protected]
```

Check if a device manager is currently active within the Scene. If not, create an instance to manager our connection(s).

5.48.3.5 DisposeDevice()

```
override void SG.SG_SenseGloveHardware.DisposeDevice ( )  [protected], [virtual]
```

Unlink this glove from the manager.

Reimplemented from SG.SG_DeviceLink.

5.48.3.6 FinishCalibration()

```
void SG.SG_SenseGloveHardware.FinishCalibration (
            GloveCalibrationArgs calibrationArgs )  [protected]
```

Used to call the OnCalibrationFinished event.

Parameters

calibrationArgs	

5.48.3.7 FlushCmds()

```
void SG.SG_SenseGloveHardware.FlushCmds ( )  [protected]
```

Update and flush all commands for this Sense Glove.

5.48.3.8 GloveEventHandler()

```
delegate void SG.SG_SenseGloveHardware.GloveEventHandler (
             object source,
             System.EventArgs args )
```

Event delegate for the glove events event.

Parameters

source	
args	

5.48.3.9 HasFunction()

```
bool SG.SG_SenseGloveHardware.HasFunction (
             GloveFunctions function )
```

Verify if this SenseGlove has a particular functionality (buzz motors, haptic feedback, etc)

Parameters

function	The function to test for

Returns

5.48.3.10 MatchesConnection()

```
static bool SG.SG_SenseGloveHardware.MatchesConnection (
             bool rightHand,
             ConnectionMethod method )  [static]
```

Check whether or not a glove with a particular handed-ness mathces a connection method.

Parameters

rightHand	
method	

Returns

5.48.3.11 OnGloveConnect()

```
void SG.SG_SenseGloveHardware.OnGloveConnect ( )  [protected]
```

Used to call the OnGloveLoaded event.

5.48.3.12 OnGloveDisconnect()

```
void SG.SG_SenseGloveHardware.OnGloveDisconnect ( )  [protected]
```

Used to call the OnGloveLoaded event.

5.48.3.13 OnGloveLink()

```
void SG.SG_SenseGloveHardware.OnGloveLink ( )  [protected]
```

Used to call the GloveLoaded event.

5.48.3.14 OnGloveUnLink()

```
void SG.SG_SenseGloveHardware.OnGloveUnLink ( )  [protected]
```

Used to call the GloveLoaded event.

5.48.3.15 ReadyCalibration()

```
virtual void SG.SG_SenseGloveHardware.ReadyCalibration (
             GloveCalibrationArgs args,
             bool fromDLL )  [protected], [virtual]
```

The Calibration of the Sense Glove should be ready to fire.

Parameters

args	
fromDLL	

5.48.3.16 ResetKinematics()

```
void SG.SG_SenseGloveHardware.ResetKinematics ( )
```

Reset the internal handmodel back to the default finger lengths and -positions

5.48.3.17 SendBrakeCmd()

```
bool SG.SG_SenseGloveHardware.SendBrakeCmd (
            int thumbCmd,
            int indexCmd,
            int middleCmd,
            int ringCmd,
            int pinkyCmd )
```

Tell the Sense Glove to set its brakes at the desired magnitude [0..100%] for each finger until it recieves a new command.

Parameters

thumbCmd	
indexCmd	
middleCmd	
ringCmd	
pinkyCmd	

Returns

Returns true if the command has been succesfully sent.

5.48.3.18 SendBuzzCmd() [1/4]

```
bool SG.SG_SenseGloveHardware.SendBuzzCmd (
            bool[] fingers,
            int magnitude = 100,
            int duration = 400,
            BuzzMotorPattern pattern = BuzzMotorPattern.Constant )
```

Send one buzzmotor command to specific fingers, as indicated by the fingers array.

Parameters

fingers	The fingers (from thumb to pinky) to which to actually apply the buzzMotor command.
magn	
dur	

Returns

5.48.3.19 SendBuzzCmd() `[2/4]`

```
bool SG.SG_SenseGloveHardware.SendBuzzCmd (
            bool[] fingers,
            int[] durations = null,
            int[] magnitudes = null,
            BuzzMotorPattern[] patterns = null )
```

Send a buzz-motor command to the Sense Glove, with optional parameters for each finger.

Parameters

fingers	
durations	
magnitudes	
patterns	

Returns

This is where the command is actually sent, with parameters for the fingers. All other SendBuzzCmd methods are wrappers.

5.48.3.20 SendBuzzCmd() `[3/4]`

```
bool SG.SG_SenseGloveHardware.SendBuzzCmd (
            Finger finger,
            int magnitude,
            int duration,
            BuzzMotorPattern pattern = BuzzMotorPattern.Constant )
```

Send a buzzmotor command to a specific finger.

Parameters

finger	
magnitude	
duration	
pattern	

Returns

5.48.3.21 SendBuzzCmd() [4/4]

```
bool SG.SG_SenseGloveHardware.SendBuzzCmd (
            int[] magnitudes,
            int duration )
```

Tell the Buzz motors to each vibrate on a different magnitude (0..100%) for a specific duration (ms)

Parameters

magnitudes	
duration	

Returns

5.48.3.22 SendThumperCmd()

```
bool SG.SG_SenseGloveHardware.SendThumperCmd (
            SenseGloveCs.ThumperEffect effect )
```

Play an effect using the Thumper module on this glove (if it has any).

Parameters

effect	

Returns

5.48.3.23 SetHandParameters()

```
void SG.SG_SenseGloveHardware.SetHandParameters (
            Vector3[] jointPositions,
            Vector3 handLengths[][] )
```

Apply hand parameters to the Sense Glove internal model.

Parameters

jointPositions	
handLengths	

5.48.3.24 SetupDevice()

```
override void SG.SG_SenseGloveHardware.SetupDevice ( )  [protected], [virtual]
```

When linked, this function is run for first time setup.

Reimplemented from SG.SG_DeviceLink.

5.48.3.25 StopBrakes()

```
bool SG.SG_SenseGloveHardware.StopBrakes ( )
```

Release all brakes of the SenseGlove.

Returns

5.48.3.26 StopBuzzMotors()

```
bool SG.SG_SenseGloveHardware.StopBuzzMotors ( )
```

Stop all vibration feedback on the Sense Glove.

Returns

5.48.3.27 StopFeedback()

```
bool SG.SG_SenseGloveHardware.StopFeedback ( )
```

Stop all forms of feedback on this Sense Glove.

Returns

5.48.3.28 UpdateGlove()

```
void SG.SG_SenseGloveHardware.UpdateGlove ( )  [protected]
```

Updates this glove's data.

5.48.3.29 WriteBrakeCmd()

```
bool SG.SG_SenseGloveHardware.WriteBrakeCmd (
            int[] commands )  [protected]
```

Tell the Sense Glove to set its brakes at the desired magnitude [0..100%] for each finger until it recieves a new command.

Parameters

commands	

Returns

Returns true if the command has been succesfully sent.

This is where the magic happens; where the actual command is sent. All other SendBrakeCmd methods are wrappers.

5.48.4 Member Data Documentation

5.48.4.1 autoConnect

```
bool SG.SG_SenseGloveHardware.autoConnect = true  [protected]
```

Allows this Sense Glove_Object to manage its own connection status

5.48.4.2 brakeQueue

```
List<int[]> SG.SG_SenseGloveHardware.brakeQueue = new List<int[]>()  [protected]
```

Command queue for the brakes, which is flushed at the end of every Update function.

5.48.4.3 buzz_Enabled

```
bool SG.SG_SenseGloveHardware.buzz_Enabled = true
```

5.48.4.4 calibrationArguments

```
List<GloveCalibrationArgs> SG.SG_SenseGloveHardware.calibrationArguments = new List<GloveCalibrationArgs>()
[protected]
```

Queued Calibration Command from the fingers, which will fire during Unity's next LateUpdate() (so as to allow acces to transforms)

5.48.4.5 connectionMethod

```
ConnectionMethod SG.SG_SenseGloveHardware.connectionMethod = ConnectionMethod.NextGlove
```

The way with which the SG_SenseGloveHardware connects to a glove.

5.48.4.6 deviceScannerPresent

```
bool SG.SG_SenseGloveHardware.deviceScannerPresent = false  [static]
```

Saves setup time for multiple SenseGlove_Objects checking for DeviceManager's existance.

5.48.4.7 lastBrakeLvls

```
int [] SG.SG_SenseGloveHardware.lastBrakeLvls = new int[5]  [protected]
```

The last sent brake command

5.48.4.8 limitFingers

```
bool SG.SG_SenseGloveHardware.limitFingers = true  [protected]
```

Whether or not to apply natural limits to the fingers.

Marked as protected since these wil likely always be true during normal use.

5.48.4.9 linkedGlove

```
SenseGlove SG.SG_SenseGloveHardware.linkedGlove = null  [protected]
```

The Internal Sense Glove object that is linked to this monobehaviour Object

5.48.4.10 linkedGloveData

```
SG_SenseGloveData SG.SG_SenseGloveHardware.linkedGloveData = SG_SenseGloveData.Empty  [protected]
```

The last data from the linked glove.

5.48.4.11 OnGloveLoad

```
SGEvent SG.SG_SenseGloveHardware.OnGloveLoad
```

Unity Even that fires when this script is assigned to a Sense Glove

5.48.4.12 sendHaptics

```
HapticSendMode SG.SG_SenseGloveHardware.sendHaptics = HapticSendMode.OnChangeRepeat  [protected]
```

When Haptic Commands are sent to the SenseGlove Hardware.

5.48.4.13 solver

```
Solver SG.SG_SenseGloveHardware.solver = Solver.Interpolate4Sensors  [protected]
```

The Solver used to calculate this Sense Glove's hand model each frame.

5.48.4.14 thumpFFBThreshold

```
int SG.SG_SenseGloveHardware.thumpFFBThreshold = 70  [static], [protected]
```

If the average force-feedback levels are above this threshold, we should not fire Thumper Commands.

5.48.4.15 updateWrist

```
bool SG.SG_SenseGloveHardware.updateWrist = true  [protected]
```

Whether or not to update the wrist model of the Sense Glove.

We will always update it, but calibrate it at hand-model level.

5.48.4.16 wasConnected

```
bool SG.SG_SenseGloveHardware.wasConnected = false  [protected]
```

Whether or not the linked glove was connected the last time we checked.

5.48.5 Property Documentation

5.48.5.1 FingerLengths

```
float [][] SG.SG_SenseGloveHardware.FingerLengths  [get], [set]
```

The finger lengths used by this sense glove as a 5x3 array, which contains the Proximal-, Medial-, and Distal Phalange lengths for each finger, in that order, in mm.

5.48.5.2 GloveData

```
SG_SenseGloveData SG.SG_SenseGloveHardware.GloveData  [get]
```

Retrieve Unity-Friendly Glove Data from the Sense Glove.

5.48.5.3 GloveReady

```
bool SG.SG_SenseGloveHardware.GloveReady  [get]
```

Determines if this glove is ready and linked to the hardware.

5.48.5.4 IsCalibrating

```
bool?  SG.SG_SenseGloveHardware.IsCalibrating  [get]
```

Check if this glove is collection calibration points.

5.48.5.5 IsConnected

```
override bool SG.SG_SenseGloveHardware.IsConnected [get]
```

Check if the Sense Glove is connected.

5.48.5.6 IsRight

```
bool SG.SG_SenseGloveHardware.IsRight [get]
```

If true, this Sense Glove is connected to a right hand. Otherwise, it is connected to a left hand.

5.48.5.7 StartJointPositions

```
Vector3 [ ] SG.SG_SenseGloveHardware.StartJointPositions [get], [set]
```

The positions of the starting finger joints, the CMC or MCP joints, relative to the glove origin.

Returns

5.48.6 Event Documentation

5.48.6.1 CalibrationFinished

```
CalibrationFinishedEventHandler SG.SG_SenseGloveHardware.CalibrationFinished
```

Occurs when the finger calibration is finished. Passes the old and new GloveData as arguments.

5.48.6.2 GloveLoaded

```
GloveEventHandler SG.SG_SenseGloveHardware.GloveLoaded
```

Called when this script is assigned a Sense Glove via the SenseGlove_DeviceManager.

5.48.6.3 GloveUnLoaded

`GloveEventHandler SG.SG_SenseGloveHardware.GloveUnLoaded`

Called when the SenseGlove_DeviceManager unlinks the Sense Glove from this object.

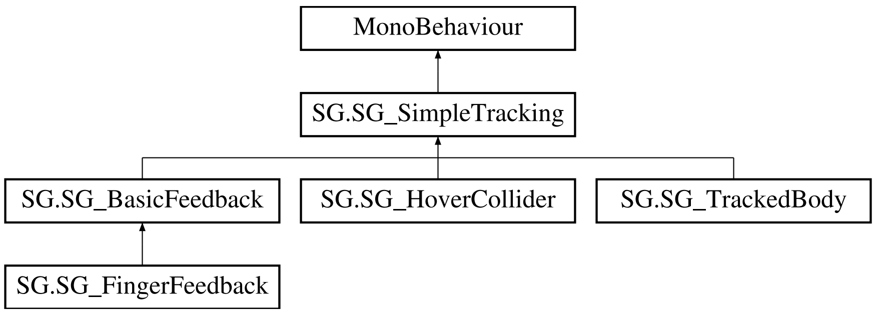
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Devices/SG_SenseGlove↩ Hardware.cs

5.49 SG.SG_SimpleTracking Class Reference

Attached to a GameObject to make it follow a 'target'

Inheritance diagram for SG.SG_SimpleTracking:



Public Types

- enum UpdateDuring { **LateUpdate**, **FixedUpdate**, **Update**, **Off** }

  When the position of this GameObject is updated.

Public Member Functions

- virtual void SetIgnoreCollision (Collider col, bool ignoreCollision)

  Ignore collision between this object and another collider
- virtual void SetTrackingTarget (Transform newTarget, bool calculateNewOffsets)

  Set a new tracking target for this script, which also calculates new offsets

Public Attributes

- UpdateDuring updateTime = UpdateDuring.LateUpdate

  Determines when an instance of this script updates its position.

Protected Member Functions

- virtual void UpdatePosition ()

    Update the transform of this script to its TragetPosition and Rotation
- virtual void **Awake** ()
- virtual void **Update** ()
- virtual void **LateUpdate** ()
- virtual void **FixedUpdate** ()

Protected Attributes

- Transform trackingTarget

    A transform to follow during the simulation. Offsets are determined during Start() of this script
- Vector3 positionOffset = Vector3.zero

    Position offset between this object and the target transform
- Quaternion rotationOffset = Quaternion.identity

    Rotation offset between this object and the target transform

Properties

- virtual bool DebugEnabled `[get, set]`

    Enable/Disable the MeshRenderer connected to this script's GameObject
- Vector3 TargetPosition `[get]`

    Returns the supposed, absolute position of this GameObject, based on its offsets.
- Quaternion TargetRotation `[get]`

    Returns the supposed, absolute rotation of this GameObject, based on its offsets.
- bool HasTarget `[get]`

    Returns true if this script has a target it can follow

5.49.1 Detailed Description

Attached to a GameObject to make it follow a 'target'

5.49.2 Member Enumeration Documentation

5.49.2.1 UpdateDuring

```
enum SG.SG_SimpleTracking.UpdateDuring [strong]
```

When the position of this GameObject is updated.

5.49.3 Member Function Documentation

5.49.3.1 SetIgnoreCollision()

```
virtual void SG.SG_SimpleTracking.SetIgnoreCollision (
            Collider col,
            bool ignoreCollision ) [virtual]
```

Ignore collision between this object and another collider

Parameters

col	

5.49.3.2 SetTrackingTarget()

```
virtual void SG.SG_SimpleTracking.SetTrackingTarget (
            Transform newTarget,
            bool calculateNewOffsets )  [virtual]
```

Set a new tracking target for this script, which also calculates new offsets

Parameters

newTarget	

5.49.3.3 UpdatePosition()

```
virtual void SG.SG_SimpleTracking.UpdatePosition ( )  [protected], [virtual]
```

Update the transform of this script to its TragetPosition and Rotation

Reimplemented in SG.SG_BasicFeedback, and SG.SG_TrackedBody.

5.49.4 Member Data Documentation

5.49.4.1 positionOffset

```
Vector3 SG.SG_SimpleTracking.positionOffset = Vector3.zero  [protected]
```

Position offset between this object and the target transform

5.49.4.2 rotationOffset

```
Quaternion SG.SG_SimpleTracking.rotationOffset = Quaternion.identity  [protected]
```

Rotation offset between this object and the target transform

5.49.4.3 trackingTarget

```
Transform SG.SG_SimpleTracking.trackingTarget  [protected]
```

A transform to follow during the simulation. Offsets are determined during Start() of this script

5.49.4.4 updateTime

```
UpdateDuring SG.SG_SimpleTracking.updateTime = UpdateDuring.LateUpdate
```

Determines when an instance of this script updates its position.

5.49.5 Property Documentation

5.49.5.1 DebugEnabled

```
virtual bool SG.SG_SimpleTracking.DebugEnabled  [get], [set]
```

Enable/Disable the MeshRenderer connected to this script's GameObject

5.49.5.2 HasTarget

```
bool SG.SG_SimpleTracking.HasTarget  [get]
```

Returns true if this script has a target it can follow

5.49.5.3 TargetPosition

```
Vector3 SG.SG_SimpleTracking.TargetPosition  [get]
```

Returns the supposed, absolute position of this GameObject, based on its offsets.

5.49.5.4 TargetRotation

```
Quaternion SG.SG_SimpleTracking.TargetRotation  [get]
```

Returns the supposed, absolute rotation of this GameObject, based on its offsets.

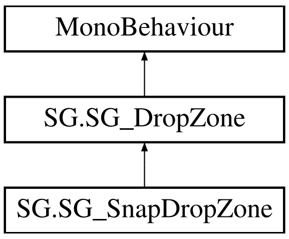
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Tracking/SG_Simple←Tracking.cs

5.50 SG.SG_SnapDropZone Class Reference

A DropZone that snaps a Grabable to a specific SnapPoint.

Inheritance diagram for SG.SG_SnapDropZone:



Classes

- class SnapProps

  Contains parameters that assist in snapping/unsnapping to a SnapZone.

Public Types

- enum SnapMethod { SnapMethod.ObjectDependent = 0, SnapMethod.Parent, SnapMethod.FixedJoint }

  The way in which a SnapZone attaches objects to itself.

Public Member Functions

- override void ValidateSettings ()

  Validates RB / Collider settings on initialization. Add another check for RigidBodies.
- override void AddObject (SG_Grabable grabable)

  Fires when an object first enters the zone. Record its snap-properties.
- bool IsSnapped (SG_Grabable grabable)

  Returns true if this particular object has been detected and snapped within the SnapZone.
- void ReleaseObject (SG_Grabable grabable)

  Release a specific object from the zone.

Public Attributes

- bool disablesInteraction = false
  When set to true, this SnapZone automatically disables the interaction of the SenseGlove_Grabables that enter it.
- bool takesFromHand = false
  If set to true, this SnapZone ends the interaction between the hand and the interactable.
- Transform snapPoint
  The point to which the SenseGlove_Grabables will attempt to snap.
- SnapMethod snapMethod = SnapMethod.ObjectDependent
  The way in which the SnapZone attaches objects to itself.

Protected Member Functions

- override void CallObjectDetect (SG_Grabable detectedObject)
  Called when an Object is detected and its event is called. End interation if needed, then snap it
- override void RemoveObject (int index)
  Fires when an object is removed from the zone. Unsubscribe from method(s).
- void AttachObject (SG_Grabable grabable)
  Snaps an object to this Zone's snapPoint, based on the Grabable's grabType.
- void ReleaseObject (int index)
  Released an obejct from physics, but not from detection
- virtual void **Start** ()

Protected Attributes

- List< SnapProps > snapProperties = new List<SnapProps>()
  Contains properties for before/after snapping

Private Member Functions

- void Grabable_InteractionBegun (object source, SG_InteractArgs args)
  Fires when an object is picked up from the Sense Glove. Disconnect it from this SnapZone.
- void Grabable_InteractionEnded (object source, SG_InteractArgs args)
  Fires when one of my ObjectsToGet is released.
- void Grabable_ObjectReset (object source, System.EventArgs args)
  Fires when an object is reset. Disconnect it from this SnapZone.

Additional Inherited Members

5.50.1 Detailed Description

A DropZone that snaps a Grabable to a specific SnapPoint.

5.50.2 Member Enumeration Documentation

5.50.2.1 SnapMethod

```
enum SG.SG_SnapDropZone.SnapMethod  [strong]
```

The way in which a SnapZone attaches objects to itself.

Enumerator

ObjectDependent	The snapzone chooses which option to use, based on the Grabable's GrabType propery
Parent	The Grabable becomes a child object of the dropzone. If it posesses a Rigidbody, it is marked as kinematic.
FixedJoint	The DropZone creates a PhysicsJoint connection between this dropzone and the grabable rigidBody.

5.50.3 Member Function Documentation

5.50.3.1 AddObject()

```
override void SG.SG_SnapDropZone.AddObject (
            SG_Grabable grabable )  [virtual]
```

Fires when an object first enters the zone. Record its snap-properties.

Parameters

grabable	

Reimplemented from SG.SG_DropZone.

5.50.3.2 AttachObject()

```
void SG.SG_SnapDropZone.AttachObject (
            SG_Grabable grabable )  [protected]
```

Snaps an object to this Zone's snapPoint, based on the Grabable's grabType.

Parameters

grabable	

5.50.3.3 CallObjectDetect()

```
override void SG.SG_SnapDropZone.CallObjectDetect (
            SG_Grabable detectedObject )  [protected], [virtual]
```

Called when an Object is detected and its event is called. End interation if needed, then snap it

Parameters

detectedObject	

Reimplemented from SG.SG_DropZone.

5.50.3.4 Grabable_InteractionBegun()

```
void SG.SG_SnapDropZone.Grabable_InteractionBegun (
             object source,
             SG_InteractArgs args )  [private]
```

Fires when an object is picked up from the Sense Glove. Disconnect it from this SnapZone.

Parameters

source	
args	

5.50.3.5 Grabable_InteractionEnded()

```
void SG.SG_SnapDropZone.Grabable_InteractionEnded (
             object source,
             SG_InteractArgs args )  [private]
```

Fires when one of my ObjectsToGet is released.

Should only be subscribed to when

Parameters

source	
args	

5.50.3.6 Grabable_ObjectReset()

```
void SG.SG_SnapDropZone.Grabable_ObjectReset (
             object source,
             System.EventArgs args )  [private]
```

Fires when an object is reset. Disconnect it from this SnapZone.

Parameters

source	
args	

5.50.3.7 IsSnapped()

```
bool SG.SG_SnapDropZone.IsSnapped (
            SG_Grabable grabable )
```

Returns true if this particular object has been detected and snapped within the SnapZone.

Parameters

grabable	

Returns

5.50.3.8 ReleaseObject() [1/2]

```
void SG.SG_SnapDropZone.ReleaseObject (
            int index ) [protected]
```

Released an obejct from physics, but not from detection

Parameters

index	

5.50.3.9 ReleaseObject() [2/2]

```
void SG.SG_SnapDropZone.ReleaseObject (
            SG_Grabable grabable )
```

Release a specific object from the zone.

Parameters

grabable	

5.50.3.10 RemoveObject()

```
override void SG.SG_SnapDropZone.RemoveObject (
             int index )  [protected], [virtual]
```

Fires when an object is removed from the zone. Unsubscribe from method(s).

Parameters

index	

Reimplemented from SG.SG_DropZone.

5.50.3.11 ValidateSettings()

```
override void SG.SG_SnapDropZone.ValidateSettings ( )  [virtual]
```

Validates RB / Collider settings on initialization. Add another check for RigidBodies.

Reimplemented from SG.SG_DropZone.

5.50.4 Member Data Documentation

5.50.4.1 disablesInteraction

```
bool SG.SG_SnapDropZone.disablesInteraction = false
```

When set to true, this SnapZone automatically disables the interaction of the SenseGlove_Grababbles that enter it.

5.50.4.2 snapMethod

```
SnapMethod SG.SG_SnapDropZone.snapMethod = SnapMethod.ObjectDependent
```

The way in which the SnapZone attaches objects to itself.

5.50.4.3 snapPoint

```
Transform SG.SG_SnapDropZone.snapPoint
```

The point to which the SenseGlove_Grabables will attempt to snap.

If no RigidBody is attached to this zone, we will attempt to look for one here.

5.50.4.4 snapProperties

```
List<SnapProps> SG.SG_SnapDropZone.snapProperties = new List<SnapProps>()  [protected]
```

Contains properties for before/after snapping

5.50.4.5 takesFromHand

```
bool SG.SG_SnapDropZone.takesFromHand = false
```

If set to true, this SnapZone ends the interaction between the hand and the interactable.

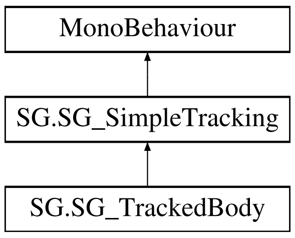
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Controls/SG_SnapDrop↩
  Zone.cs

5.51 SG.SG_TrackedBody Class Reference

A Rigidbody that tracks a transform by adding velocity to the body, rather than directly applying positions. It reverts back to simpleTrackign if no Rigidbody is present.

Inheritance diagram for SG.SG_TrackedBody:



Public Member Functions

- void TryAddRB (bool useGrav=false, bool isKinematic=false)
  Try to add a rigidbody to this GameObject, if one isn't already present
- void TryRemoveRB ()
  Remove the Rigidbody if one exists.

Public Attributes

- Rigidbody physicsBody

  The RigidBody to apply force-feebdack to.

Protected Member Functions

- override void UpdatePosition ()

  Update this object's transform by applying a velocity to the rigidbody
- override void **Awake** ()

Protected Attributes

- float resetTimer = 0

  Timer to keep track of how long the collider has been away from its target transform

Static Protected Attributes

- static float resetTime = 3

  Time after which the rigidbody will reset back to its targetposition if it is more than resetDistance away
- static float resetDistance = 1

  Maximum distance between this script and it's target position before we assume the colliders are stuck somewhere.
- static float rotationSpeed = 25

  Speed at which the rotation is matched

Properties

- bool CollisionEnabled `[get, set]`

  Enable / Disable collision of this collider in general

Additional Inherited Members

5.51.1 Detailed Description

A Rigidbody that tracks a transform by adding velocity to the body, rather than directly applying positions. It reverts back to simpleTrackign if no Rigidbody is present.

5.51.2 Member Function Documentation

5.51.2.1 TryAddRB()

```
void SG.SG_TrackedBody.TryAddRB (
            bool useGrav = false,
            bool isKinematic = false )
```

Try to add a rigidbody to this GameObject, if one isn't already present

Parameters

useGrav	
isKinematic	

5.51.2.2 TryRemoveRB()

```
void SG.SG_TrackedBody.TryRemoveRB ( )
```

Remove the Rigidbody if one exists.

5.51.2.3 UpdatePosition()

```
override void SG.SG_TrackedBody.UpdatePosition ( )  [protected], [virtual]
```

Update this object's transform by applying a velocity to the rigidbody

Reimplemented from SG.SG_SimpleTracking.

5.51.3 Member Data Documentation

5.51.3.1 physicsBody

```
Rigidbody SG.SG_TrackedBody.physicsBody
```

The RigidBody to apply force-feebdack to.

5.51.3.2 resetDistance

```
float SG.SG_TrackedBody.resetDistance = 1  [static], [protected]
```

Maximum distance between this script and it's target position before we assume the colliders are stuck somewhere.

5.51.3.3 resetTime

```
float SG.SG_TrackedBody.resetTime = 3  [static], [protected]
```

Time after which the rigidbody will reset back to its targetposition if it is more than resetDistance away

5.51.3.4 resetTimer

```
float SG.SG_TrackedBody.resetTimer = 0  [protected]
```

Timer to keep track of how long the collider has been away from its target transform

5.51.3.5 rotationSpeed

```
float SG.SG_TrackedBody.rotationSpeed = 25  [static], [protected]
```

Speed at which the rotation is matched

5.51.4 Property Documentation

5.51.4.1 CollisionEnabled

```
bool SG.SG_TrackedBody.CollisionEnabled  [get], [set]
```

Enable / Disable collision of this collider in general

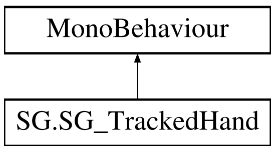
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Tracking/SG_Tracked↩ Body.cs

5.52 SG.SG_TrackedHand Class Reference

A hand model with different layers, that follows a GameObject with a configurable offset

Inheritance diagram for SG.SG_TrackedHand:



Public Types

- enum TrackingHardware { TrackingHardware.Custom, TrackingHardware.ViveTracker }

  The hardware this hand is tracked with. Used to calculate offsets.
- enum TrackingMethod { TrackingMethod.Default, TrackingMethod.PhysicsBased, TrackingMethod.Disabled }

  The way the tracking is estableshed.

Public Member Functions

- virtual void SwapTracking (SG_TrackedHand otherHand)

  Swap the tracking targets between this hand an another one.
- void UpdateTransformDefault ()

  Update this script's transform by applying a position and rotation directly.
- void UpdateTransformPhysics ()

  Update this script's transform by applying a velocity to its rigidbody.
- void **OnCollisionEnter** (Collision collision)

Public Attributes

- SG_SenseGloveHardware hardware

  The hand tracking hardware used to animae / link this TrackedHand.
- TrackingHardware trackingHardware = TrackingHardware.ViveTracker

  The hardware that controls the trackedObject's position. Used to calultae offsets.
- TrackingMethod trackingMethod = TrackingMethod.Default

  How the position of this TrackedHand is determined.
- SG_HandModelInfo handModel

  Information of the 3D model of the hand this script represents.
- SG_HandAnimator handAnimation

  The script that animates this trackedHand
- SG_HandFeedback feedbackScript

  The script responsble for collecting force-feedback from objects to this hardware.
- SG_GrabScript grabScript

  The script responsible for grabbing and manipulating objects.
- SG_HandRigidBodies rigidBodyLayer

  The script that allows this hand to push objects away.
- SG_HandRigidBodies physicsTrackingLayer

  The script that prevents this hand from passing through non-trigger colliders.

Protected Member Functions

- void CheckForScripts ()

  Link relevant scripts to this trackedHand, if they have not been assinged yet.
- virtual void SetupTracking (Transform newTarget, TrackingHardware trackType, TrackingMethod trackMethod, bool rightHand)

  Setup and/or change the tracking variables of this hand.
- virtual void **Awake** ()
- virtual void **Start** ()
- void **Update** ()
- void **FixedUpdate** ()

Protected Attributes

- Transform trackedObject

  The object that this script will attempt to follow.
- bool ignoreGrababIes = false

  If set to true, this hand will ignore collisions with SG_Interactable objects that its rigidbody collides with.
- Vector3 positionOffset = Vector3.zero

  The position offset between this trackedHand and its trackedObject.
- Quaternion rotationOffset = Quaternion.identity

  The rotation offset between this trackedHand and its trackedObject.
- Rigidbody handRB = null

  This object's Rigidbody, used when dealing with Physics-based tracking.

Static Protected Attributes

- static float physRotationSpeed = 25

  The rotation speed of the Rigidbody, when using Physics-based tracking.

Properties

- Vector3? TargetPosition `[get]`

  The position that this trackedHand should be in, based on its trackedObject and offsets.
- Quaternion? TargetRotation `[get]`

  The rotation that this trackedHand should be in, based on its trackedObject and offsets.
- virtual bool TracksRightHand `[get]`

  Returns true if this Script is set up to track a right hand.

5.52.1 Detailed Description

A hand model with different layers, that follows a GameObject with a configurable offset

5.52.2 Member Enumeration Documentation

5.52.2.1 TrackingHardware

`enum SG.SG_TrackedHand.TrackingHardware [strong]`

The hardware this hand is tracked with. Used to calculate offsets.

Enumerator

Custom	Custom tracking hardware is used, so offsets are calculated during Start().
ViveTracker	SenseGlove Vive Tracker Mount

5.52.2.2 TrackingMethod

```
enum SG.SG_TrackedHand.TrackingMethod  [strong]
```

The way the tracking is estableshed.

Enumerator

Default	The hand matches the trackedObject's position and rotations, with offsets.
PhysicsBased	The hand gets a rigidbody, which attempts to reach its targetRotation and -position
Disabled	This script does not handle any tracking. Use this when making the hand a child of your trackedObject.

5.52.3 Member Function Documentation

5.52.3.1 CheckForScripts()

```
void SG.SG_TrackedHand.CheckForScripts ( )  [protected]
```

Link relevant scripts to this trackedHand, if they have not been assinged yet.

5.52.3.2 SetupTracking()

```
virtual void SG.SG_TrackedHand.SetupTracking (
             Transform newTarget,
             TrackingHardware trackType,
             TrackingMethod trackMethod,
             bool rightHand )  [protected], [virtual]
```

Setup and/or change the tracking variables of this hand.

Parameters

newTarget	
trackType	
trackMethod	
rightHand	

5.52.3.3 SwapTracking()

```
virtual void SG.SG_TrackedHand.SwapTracking (
            SG_TrackedHand otherHand )  [virtual]
```

Swap the tracking targets between this hand an another one.

Parameters

otherHand	

5.52.3.4 UpdateTransformDefault()

```
void SG.SG_TrackedHand.UpdateTransformDefault ( )
```

Update this script's transform by applying a position and rotation directly.

5.52.3.5 UpdateTransformPhysics()

```
void SG.SG_TrackedHand.UpdateTransformPhysics ( )
```

Update this script's transform by applying a velocity to its rigidbody.

5.52.4 Member Data Documentation

5.52.4.1 feedbackScript

```
SG_HandFeedback SG.SG_TrackedHand.feedbackScript
```

The script responsble for collecting force-feedback from objects to this hardware.

5.52.4.2 grabScript

```
SG_GrabScript SG.SG_TrackedHand.grabScript
```

The script responsible for grabbing and manipulating objects.

5.52.4.3 handAnimation

`SG_HandAnimator SG.SG_TrackedHand.handAnimation`

The script that animates this trackedHand

5.52.4.4 handModel

`SG_HandModelInfo SG.SG_TrackedHand.handModel`

Information of the 3D model of the hand this script represents.

5.52.4.5 handRB

`Rigidbody SG.SG_TrackedHand.handRB = null  [protected]`

This object's Rigidbody, used when dealing with Physics-based tracking.

5.52.4.6 hardware

`SG_SenseGloveHardware SG.SG_TrackedHand.hardware`

The hand tracking hardware used to animae / link this TrackedHand.

5.52.4.7 ignoreGrabables

`bool SG.SG_TrackedHand.ignoreGrabables = false  [protected]`

If set to true, this hand will ignore collisions with SG_Interactable objects that its rigidbody collides with.

The PhysicsTrackingLayer bodies have no rigidbodies of their own, and so their OnCollisionEnter events fire here.

5.52.4.8 physicsTrackingLayer

`SG_HandRigidBodies SG.SG_TrackedHand.physicsTrackingLayer`

The script that prevents this hand from passing through non-trigger colliders.

5.52.4.9 physRotationSpeed

```
float SG.SG_TrackedHand.physRotationSpeed = 25  [static], [protected]
```

The rotation speed of the Rigidbody, when using Physics-based tracking.

5.52.4.10 positionOffset

```
Vector3 SG.SG_TrackedHand.positionOffset = Vector3.zero  [protected]
```

The position offset between this trackedHand and its trackedObject.

5.52.4.11 rigidBodyLayer

```
SG_HandRigidBodies SG.SG_TrackedHand.rigidBodyLayer
```

The script that allows this hand to push objects away.

5.52.4.12 rotationOffset

```
Quaternion SG.SG_TrackedHand.rotationOffset = Quaternion.identity  [protected]
```

The rotation offset between this trackedHand and its trackedObject.

5.52.4.13 trackedObject

```
Transform SG.SG_TrackedHand.trackedObject  [protected]
```

The object that this script will attempt to follow.

5.52.4.14 trackingHardware

```
TrackingHardware SG.SG_TrackedHand.trackingHardware = TrackingHardware.ViveTracker
```

The hardware that controls the trackedObject's position. Used to calultae offsets.

5.52.4.15 trackingMethod

```
TrackingMethod SG.SG_TrackedHand.trackingMethod = TrackingMethod.Default
```

How the position of this TrackedHand is determined.

5.52.5 Property Documentation

5.52.5.1 TargetPosition

```
Vector3?  SG.SG_TrackedHand.TargetPosition  [get]
```

The position that this trackedHand should be in, based on its trackedObject and offsets.

5.52.5.2 TargetRotation

```
Quaternion?  SG.SG_TrackedHand.TargetRotation  [get]
```

The rotation that this trackedHand should be in, based on its trackedObject and offsets.

5.52.5.3 TracksRightHand

```
virtual bool SG.SG_TrackedHand.TracksRightHand  [get]
```

Returns true if this Script is set up to track a right hand.

Returns

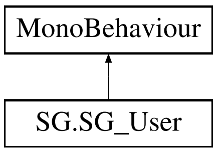
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Tracking/SG_Tracked↩
  Hand.cs

5.53 SG.SG_User Class Reference

Utility Class to manage up to two SG_TrackedHands, and to swap their hands around.

Inheritance diagram for SG.SG_User:



Public Member Functions

- void SetupHands ()

  Set up the collision of the hands
- void **SwapHandTracking** ()

Public Attributes

- SG_TrackedHand **leftHand**
- SG_TrackedHand **rightHand**
- KeyCode **swapHandsKey** = KeyCode.None

Private Member Functions

- void **Start** ()
- void **Update** ()

5.53.1 Detailed Description

Utility Class to manage up to two SG_TrackedHands, and to swap their hands around.

5.53.2 Member Function Documentation

5.53.2.1 SetupHands()

```
void SG.SG_User.SetupHands ( )
```

Set up the collision of the hands

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Util/SG_User.cs

5.54 SG.SG_Util Class Reference

Contains methods that make the SenseGloveCs library work with Unity.

Public Types

- enum **MoveAxis** {
  X = 0, **Y**, **Z**, **NegativeX**,
  NegativeY, **NegativeZ** }

Static Public Member Functions

- static string ToString (Vector3 V)

  Convert a Unity Vector3 to a string with a greater precision that it default method.
- static string ToString (Quaternion Q)

  Convert a Unity Quaternion to a string with a greater precision that it default method.
- static string ToString (float[ ] V)

  Convert a float[] to a string with a greater precision that it default Unity(?) method.
- static string ToString (int[ ] V)

  Convert an int[] to a string with a greater precision that it default Unity(?) method.
- static Vector3 ToUnityPosition (SenseGloveCs.Kinematics.Vect3D pos)

  Convert a float[3] position taken from the DLL into a Unity Position.
- static Vector3[ ] ToUnityPosition (SenseGloveCs.Kinematics.Vect3D[ ] pos)

  Convert an array of float[3] positions taken from the DLL into a Vector3[].
- static SenseGloveCs.Kinematics.Vect3D ToPosition (Vector3 pos)

  Convert from a unity vector3 to a float[3] used in the DLL.
- static SenseGloveCs.Kinematics.Vect3D[ ] ToPosition (Vector3[ ] pos)

  Convert an array of unity positions back into an array used by the DLL
- static Quaternion ToUnityQuaternion (SenseGloveCs.Kinematics.Quat quat)

  Convert a float[4] quaternion taken from the DLL into a Unity Quaternion.
- static SenseGloveCs.Kinematics.Quat ToQuaternion (Quaternion Q)

  Convert a unity Quaternion into a float[4] used in the DLL.
- static SenseGloveCs.Kinematics.Vect3D ToEuler (Vector3 euler)

  Convert a unity eulerAngles notation into one used by the DLL.
- static Vector3 ToUnityEuler (SenseGloveCs.Kinematics.Vect3D euler)

  Convert a set of euler angles from the DLL into the Unity notation.
- static float NormalizeAngle (float angle)

  Normalize an angle (in degrees) such that it is within the -180...180 range.
- static float NormalizeAngle (float angle, float minAngle, float maxAngle)

  Normalize an angle (in degrees) such that it is within the -180...180 range.
- static Vector3 NormalizeAngles (Vector3 angles)

  Normalize a set of (euler) angles to fall within a -180... 180 range.
- static float Map (float value, float inMin, float inMax, float outMin, float outMax)

  Map a value from one range to another.
- static Vector3 Average (List< Vector3 > values)

  Calculates the average between a list of Vector3 values
- static int Average (int[ ] values)

  Calculates the average between a list of integer values
- static Vector3 CalculateAngularVelocity (Quaternion currentRot, Quaternion previousRot, float deltaTime)

Calculate the angular velocity of a GameObject, using its current rotation and that of the previous frame.
- static void CalculateOffsets (Transform obj, Transform reference, out Vector3 posOffset, out Quaternion rot↩ Offset)

  Calculate a position and rotation difference between two transforms.
- static void TransformRigidBody (ref Rigidbody obj, Vector3 targetPosition, Quaternion targetRotation, float rotationSpeed)

  Add a velocity / angularVelocity to a rigidbody to move towards a targetPosition and rotation
- static Rigidbody TryAddRB (GameObject obj, bool useGrav=false, bool isKinematic=false)

  Add a rigidbody to a GameObject if one does not exist yet and apply the desired parameters.
- static void TryRemoveRB (GameObject obj)

  Remove the rigidbody from a gameObject, if one exists.
- static void CheckForHandInfo (Transform obj, ref SG_HandModelInfo info)

  Check if an object has a SG_HandModelInfo component and assign it to the info parameter.
- static SG_TrackedHand CheckForTrackedHand (Transform obj)

  Try to get a SG_TrackedHand that this script is attached to.
- static void SetChildren (Transform obj, bool active)

  Set all the children of the following Transform to active/inactive
- static Vector3 GetAxis (MovementAxis axis)

  Returns a unit vector representing the chosen movement axis.
- static bool IsNegative (MoveAxis axis)

  Returns true if this axis is negative
- static int AxisIndex (MoveAxis axis)

  Returns an index (0, 1, 2) to access a Vector3
- static Vector3 GetVector (MoveAxis axis)

  Returns a normalized Vector repesenting this axis in 3D space.
- static GameObject SpawnSphere (float worldDiameter, Transform parent, bool withCollider=true)

  Spawn a sphere and make it a child of parent.
- static void AppendButtonText (UnityEngine.UI.Button button, string addedText)

  Append texts to existing button text (used to add hotkey info to buttons)

Static Public Attributes

- static bool **keyBindsEnabled** = true

Properties

- static string **SenseGloveDir** `[get]`

5.54.1 Detailed Description

Contains methods that make the SenseGloveCs library work with Unity.

5.54.2 Member Function Documentation

5.54.2.1 AppendButtonText()

```
static void SG.SG_Util.AppendButtonText (
            UnityEngine.UI.Button button,
            string addedText )  [static]
```

Append texts to existing button text (used to add hotkey info to buttons)

Parameters

button	
addedText	

5.54.2.2 Average() [1/2]

```
static int SG.SG_Util.Average (
            int[] values )  [static]
```

Calculates the average between a list of integer values

Parameters

values	

Returns

5.54.2.3 Average() [2/2]

```
static Vector3 SG.SG_Util.Average (
            List< Vector3 > values )  [static]
```

Calculates the average between a list of Vector3 values

Parameters

values	

Returns

5.54.2.4 AxisIndex()

```
static int SG.SG_Util.AxisIndex (
            MoveAxis axis )  [static]
```

Returns an index (0, 1, 2) to access a Vector3

Parameters

axis	

Returns

5.54.2.5 CalculateAngularVelocity()

```
static Vector3 SG.SG_Util.CalculateAngularVelocity (
             Quaternion currentRot,
             Quaternion previousRot,
             float deltaTime )  [static]
```

Calculate the angular velocity of a GameObject, using its current rotation and that of the previous frame.

Parameters

currentRot	
previousRot	

Placed here because it may be used by other scripts as well.

Returns

5.54.2.6 CalculateOffsets()

```
static void SG.SG_Util.CalculateOffsets (
             Transform obj,
             Transform reference,
             out Vector3 posOffset,
             out Quaternion rotOffset )  [static]
```

Calculate a position and rotation difference between two transforms.

Parameters

obj	
reference	
posOffset	
rotOffset	

5.54.2.7 CheckForHandInfo()

```
static void SG.SG_Util.CheckForHandInfo (
             Transform obj,
             ref SG_HandModelInfo info )  [static]
```

Check if an object has a SG_HandModelInfo component and assign it to the info parameter.

Parameters

obj	
info	

5.54.2.8 CheckForTrackedHand()

```
static SG_TrackedHand SG.SG_Util.CheckForTrackedHand (
             Transform obj )  [static]
```

Try to get a SG_TrackedHand that this script is attached to.

Parameters

obj	
handScript	

5.54.2.9 GetAxis()

```
static Vector3 SG.SG_Util.GetAxis (
             MovementAxis axis )  [static]
```

Returns a unit vector representing the chosen movement axis.

Parameters

axis	

Returns

5.54.2.10 GetVector()

```
static Vector3 SG.SG_Util.GetVector (
            MoveAxis axis )  [static]
```

Returns a normalized Vector repesenting this axis in 3D space.

Parameters

axis	

Returns

5.54.2.11 IsNegative()

```
static bool SG.SG_Util.IsNegative (
            MoveAxis axis )  [static]
```

Returns true if this axis is negative

Parameters

axis	

Returns

5.54.2.12 Map()

```
static float SG.SG_Util.Map (
            float value,
            float inMin,
            float inMax,
            float outMin,
            float outMax )  [static]
```

Map a value from one range to another.

Parameters

value	
inMin	
inMax	
outMin	
outMax	

Returns

5.54.2.13 NormalizeAngle() [1/2]

```
static float SG.SG_Util.NormalizeAngle (
             float angle )  [static]
```

Normalize an angle (in degrees) such that it is within the -180...180 range.

Parameters

angle	

Returns

5.54.2.14 NormalizeAngle() [2/2]

```
static float SG.SG_Util.NormalizeAngle (
             float angle,
             float minAngle,
             float maxAngle )  [static]
```

Normalize an angle (in degrees) such that it is within the -180...180 range.

Parameters

angle	

Returns

5.54.2.15 NormalizeAngles()

```
static Vector3 SG.SG_Util.NormalizeAngles (
             Vector3 angles )  [static]
```

Normalize a set of (euler) angles to fall within a -180... 180 range.

Parameters

angles	

Returns

5.54.2.16 SetChildren()

```
static void SG.SG_Util.SetChildren (
            Transform obj,
            bool active )  [static]
```

Set all the children of the following Transform to active/inactive

Parameters

obj	
active	

5.54.2.17 SpawnSphere()

```
static GameObject SG.SG_Util.SpawnSphere (
            float worldDiameter,
            Transform parent,
            bool withCollider = true )  [static]
```

Spawn a sphere and make it a child of parent.

Parameters

worldDiameter	
parent	
withCollider	

Returns

5.54.2.18 ToEuler()

```
static SenseGloveCs.Kinematics.Vect3D SG.SG_Util.ToEuler (
            Vector3 euler )  [static]
```

Convert a unity eulerAngles notation into one used by the DLL.

Parameters

euler	

Returns

5.54.2.19 ToPosition() [1/2]

```
static SenseGloveCs.Kinematics.Vect3D SG.SG_Util.ToPosition (
            Vector3 pos )  [static]
```

Convert from a unity vector3 to a float[3] used in the DLL.

Parameters

pos	

Returns

5.54.2.20 ToPosition() [2/2]

```
static SenseGloveCs.Kinematics.Vect3D [] SG.SG_Util.ToPosition (
            Vector3[] pos )  [static]
```

Convert an array of unity positions back into an array used by the DLL

Parameters

pos	

Returns

5.54.2.21 ToQuaternion()

```
static SenseGloveCs.Kinematics.Quat SG.SG_Util.ToQuaternion (
             Quaternion Q )  [static]
```

Convert a unity Quaternion into a float[4] used in the DLL.

Parameters

Q	

Returns

5.54.2.22 ToString() [1/4]

```
static string SG.SG_Util.ToString (
             float[] V )  [static]
```

Convert a float[] to a string with a greater precision that it default Unity(?) method.

Parameters

V	

Returns

5.54.2.23 ToString() [2/4]

```
static string SG.SG_Util.ToString (
             int[] V )  [static]
```

Convert an int[] to a string with a greater precision that it default Unity(?) method.

Parameters

V	

Returns

5.54.2.24 ToString() [3/4]

```
static string SG.SG_Util.ToString (
            Quaternion Q )  [static]
```

Convert a Unity Quaternion to a string with a greater precision that it default method.

Parameters

Q	

Returns

5.54.2.25 ToString() [4/4]

```
static string SG.SG_Util.ToString (
            Vector3 V )  [static]
```

Convert a Unity Vector3 to a string with a greater precision that it default method.

Parameters

V	

Returns

5.54.2.26 ToUnityEuler()

```
static Vector3 SG.SG_Util.ToUnityEuler (
            SenseGloveCs.Kinematics.Vect3D euler )  [static]
```

Convert a set of euler angles from the DLL into the Unity notation.

Parameters

euler	

Returns

5.54.2.27 ToUnityPosition() [1/2]

```
static Vector3 SG.SG_Util.ToUnityPosition (
            SenseGloveCs.Kinematics.Vect3D pos )  [static]
```

Convert a float[3] position taken from the DLL into a Unity Position.

Parameters

pos	

Returns

5.54.2.28 ToUnityPosition() [2/2]

```
static Vector3 [] SG.SG_Util.ToUnityPosition (
            SenseGloveCs.Kinematics.Vect3D[] pos )  [static]
```

Convert an array of float[3] positions taken from the DLL into a Vector3[].

Parameters

pos	

Returns

5.54.2.29 ToUnityQuaternion()

```
static Quaternion SG.SG_Util.ToUnityQuaternion (
            SenseGloveCs.Kinematics.Quat quat )  [static]
```

Convert a float[4] quaternion taken from the DLL into a Unity Quaternion.

Parameters

quat	

Returns

5.54.2.30 TransformRigidBody()

```
static void SG.SG_Util.TransformRigidBody (
             ref Rigidbody obj,
             Vector3 targetPosition,
             Quaternion targetRotation,
             float rotationSpeed )  [static]
```

Add a velocity / angularVelocity to a rigidbody to move towards a targetPosition and rotation

Parameters

obj	
targetPosition	
targetRotation	
rotationSpeed	

5.54.2.31 TryAddRB()

```
static Rigidbody SG.SG_Util.TryAddRB (
             GameObject obj,
             bool useGrav = false,
             bool isKinematic = false )  [static]
```

Add a rigidbody to a GameObject if one does not exist yet and apply the desired parameters.

Parameters

obj	
useGrav	
isKinematic	

Returns

5.54.2.32 TryRemoveRB()

```
static void SG.SG_Util.TryRemoveRB (
             GameObject obj )  [static]
```

Remove the rigidbody from a gameObject, if one exists.

Parameters

obj	

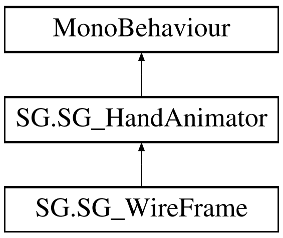
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Util/SG_Util.cs

5.55 SG.SG_WireFrame Class Reference

Type of SG_HandAnimator to debug hardware- and software models.

Inheritance diagram for SG.SG_WireFrame:



Public Member Functions

- override void UpdateHand (SG_SenseGloveData data)

    (Manually) Update the hand and glove model of the wireframe.
- override void ResizeHand (float[ ][ ] newLengths)

    Resizes the (white) cylinders that connect to the hand.
- void SetGlove (bool active)

    Enable / Disable the drawing of the Glove.
- void SetHand (bool active)

    Enable / Disable the drawing of the Hand Model.

Public Attributes

- GameObject gloveBase

    The GameObject that will contain the glove sections.
- GameObject gloveSectionModel

    A GameObject with four children: Three cylinders representing dX dY dZ, and a sphere representing the point itself.
- GameObject handBase

    The GameObject that will contain the finger sections (phalange models).
- GameObject phalangeModel

    A GameObject with two children, One Cylinder representing the Phalange Lengths, and a sphere representing the joint.
- GameObject handPalmModel

    A simple model representing the hand palm, to help make the model less abstract.
- GameObject previewGroup

    A group of models that represent a preview of the hand, which will be deleted upon the glove connecting.
- KeyCode toggleHandKey = KeyCode.None

    Key Code to manually toggle hand model rendering.
- KeyCode toggleGloveKey = KeyCode.None

    Key Code to manually toggle glove model rendering.

Protected Member Functions

- override void CollectFingerJoints ()

    Collect the finger joints. If these do not exist yet, try again.
- override void SenseGlove_OnGloveLoaded (object source, EventArgs args)

    Override the OnGloveLoaded event so we may create the glove model.
- override void SenseGlove_OnCalibrationFinished (object source, SG_SenseGloveHardware.GloveCalibrationArgs args)

    Keeps the glove index position on the same location, while shifting the other glove fingers back or forth.

Private Member Functions

- void SetupGlove (SG_SenseGloveData gloveData)

    Create a new glove section based on the parameters sent from the Sense Glove.
- void SetupFingers (SG_SenseGloveData gloveData)

    Create all the individual finger sections based on the glove's handModel.
- void SetupHandPalm (bool right)

    Assign the proper name to the hand palm model and mirror it if nessecary.

Private Attributes

- bool setupComplete = false

    Do not run the setups more than once.
- Transform[ ][ ] gloveJoints

    Glove joints to which the gloveAngles are applied.

Additional Inherited Members

5.55.1 Detailed Description

Type of SG_HandAnimator to debug hardware- and software models.

5.55.2 Member Function Documentation

5.55.2.1 CollectFingerJoints()

```
override void SG.SG_WireFrame.CollectFingerJoints ( )  [protected], [virtual]
```

Collect the finger joints. If these do not exist yet, try again.

Implements SG.SG_HandAnimator.

5.55.2.2 ResizeHand()

```
override void SG.SG_WireFrame.ResizeHand (
             float newLengths[ ][ ] )  [virtual]
```

Resizes the (white) cylinders that connect to the hand.

Parameters

newLengths	

Reimplemented from SG.SG_HandAnimator.

5.55.2.3 SenseGlove_OnCalibrationFinished()

```
override void SG.SG_WireFrame.SenseGlove_OnCalibrationFinished (
             object source,
             SG_SenseGloveHardware.GloveCalibrationArgs args )  [protected], [virtual]
```

Keeps the glove index position on the same location, while shifting the other glove fingers back or forth.

Parameters

source	
args	

Reimplemented from SG.SG_HandAnimator.

5.55.2.4 SenseGlove_OnGloveLoaded()

```
override void SG.SG_WireFrame.SenseGlove_OnGloveLoaded (
             object source,
             EventArgs args )  [protected]
```

Override the OnGloveLoaded event so we may create the glove model.

Parameters

source	
args	

5.55.2.5 SetGlove()

```
void SG.SG_WireFrame.SetGlove (
             bool active )
```

Enable / Disable the drawing of the Glove.

Parameters

active	

5.55.2.6 SetHand()

```
void SG.SG_WireFrame.SetHand (
             bool active )
```

Enable / Disable the drawing of the Hand Model.

Parameters

active	

5.55.2.7 SetupFingers()

```
void SG.SG_WireFrame.SetupFingers (
            SG_SenseGloveData gloveData )  [private]
```

Create all the individual finger sections based on the glove's handModel.

Parameters

gloveData	

5.55.2.8 SetupGlove()

```
void SG.SG_WireFrame.SetupGlove (
            SG_SenseGloveData gloveData )  [private]
```

Create a new glove section based on the parameters sent from the Sense Glove.

Parameters

gloveData	

5.55.2.9 SetupHandPalm()

```
void SG.SG_WireFrame.SetupHandPalm (
            bool right )  [private]
```

Assign the proper name to the hand palm model and mirror it if nessecary.

Parameters

right	

5.55.2.10 UpdateHand()

```
override void SG.SG_WireFrame.UpdateHand (
            SG_SenseGloveData data )  [virtual]
```

(Manually) Update the hand and glove model of the wireframe.

Parameters

data	

Reimplemented from SG.SG_HandAnimator.

5.55.3 Member Data Documentation

5.55.3.1 gloveBase

```
GameObject SG.SG_WireFrame.gloveBase
```

The GameObject that will contain the glove sections.

5.55.3.2 gloveJoints

```
Transform [ ][ ] SG.SG_WireFrame.gloveJoints  [private]
```

Glove joints to which the gloveAngles are applied.

5.55.3.3 gloveSectionModel

```
GameObject SG.SG_WireFrame.gloveSectionModel
```

A GameObject with four children: Three cylinders representing dX dY dZ, and a sphere representing the point itself.

5.55.3.4 handBase

```
GameObject SG.SG_WireFrame.handBase
```

The GameObject that will contain the finger sections (phalange models).

5.55.3.5 handPalmModel

```
GameObject SG.SG_WireFrame.handPalmModel
```

A simple model representing the hand palm, to help make the model less abstract.

5.55.3.6 phalangeModel

```
GameObject SG.SG_WireFrame.phalangeModel
```

A GameObject with two children, One Cylinder representing the Phalange Lengths, and a sphere representing the joint.

5.55.3.7 previewGroup

```
GameObject SG.SG_WireFrame.previewGroup
```

A group of models that represent a preview of the hand, which will be deleted upon the glove connecting.

5.55.3.8 setupComplete

```
bool SG.SG_WireFrame.setupComplete = false  [private]
```

Do not run the setups more than once.

5.55.3.9 toggleGloveKey

```
KeyCode SG.SG_WireFrame.toggleGloveKey = KeyCode.None
```

Key Code to manually toggle glove model rendering.

5.55.3.10 toggleHandKey

```
KeyCode SG.SG_WireFrame.toggleHandKey = KeyCode.None
```

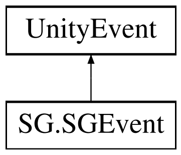
Key Code to manually toggle hand model rendering.

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Util/SG_WireFrame.cs

5.56 SG.SGEvent Class Reference

Inheritance diagram for SG.SGEvent:



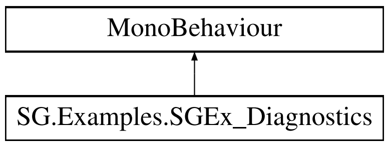
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Util/SG_Util.cs

5.57 SG.Examples.SGEx_Diagnostics Class Reference

Allows one to access certain Sense Glove fucntions using the keys on the keyboard.

Inheritance diagram for SG.Examples.SGEx_Diagnostics:



Public Member Functions

- void **CalibrateWrist** ()
- void **SetFFB** (int finger, int level)
- void **SetFFB** (int[ ] levels)
- void **ToggleFFB** ()
- void **SetBuzz** (int finger, int level)
- void **SetBuzz** (int[ ] levels)
- void **ToggleBuzz** ()
- void **BeginTestThumper** (bool loops)
- void **EndTestThumper** ()
- void **SetBrakeBuzz** (int[ ] ffb, int[ ] buzz)
- void **EngageAllFeedback** ()
- void **EndAllFeedback** ()
- void **ToggleAllFeedback** ()

Public Attributes

- SG_SenseGloveHardware **senseGlove**
- Text **instructText**
- bool **hotKeysEnabled** = true
- KeyCode **toggleAllFFBKey** = KeyCode.Return
- KeyCode **toggleAllBuzzKey** = KeyCode.B
- KeyCode **testThumperKey** = KeyCode.T
- KeyCode **fullLoadKey** = KeyCode.F
- KeyCode **calibrateWristKey** = KeyCode.P
- GameObject[ ] **disableUntilFound** = new GameObject[0]

Properties

- string **Instructions** `[set]`
- bool **CanTestFFB** `[get]`
- int[ ] **FFBLvls** `[get, private set]`
- bool **AllFFBOn** `[get]`
- bool **CanTestBuzzMotors** `[get]`
- int[ ] **BuzzMotorLvls** `[get, private set]`
- bool **AllBuzzOn** `[get]`
- bool **CanTestThumper** `[get]`
- bool **ThumperOn** `[get, private set]`
- bool **AllFeedbackOn** `[get]`

Private Member Functions

- void **UpdateDiagnostics** ()
- void **SendThumperCmd** (ThumperEffect effect)
- void **UpdateThumper** ()
- void **Awake** ()
- void **Start** ()
- void **Update** ()

Private Attributes

- bool **firstLink** = false
- float **thumperTimer** = 0
- float **thumpTime** = 1.2f
- SenseGloveCs.ThumperEffect **thumperToTest** = SenseGloveCs.ThumperEffect.Impact_Thump_100
- string **baseInst** = ""

5.57.1 Detailed Description

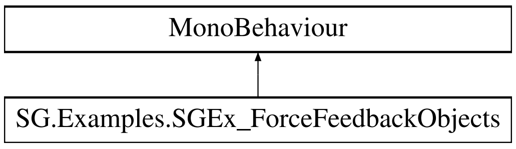
Allows one to access certain Sense Glove fucntions using the keys on the keyboard.

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Examples/Resources/SGEx_↩ Diagnostics.cs

5.58 SG.Examples.SGEx_ForceFeedbackObjects Class Reference

Inheritance diagram for SG.Examples.SGEx_ForceFeedbackObjects:



Public Member Functions

- void **CalibrateWrist** ()
- void **NextObject** ()
- void **PreviousObject** ()

Static Public Member Functions

- static bool **CheckHandOpen** (SG_TrackedHand hand)

Public Attributes

- SG_TrackedHand **leftHand**
- KeyCode **nextObjKey** = KeyCode.D
- KeyCode **prevObjKey** = KeyCode.A
- KeyCode **calibrateWristKey** = KeyCode.P
- Button **nextButton**
- Button **wristButton**
- GameObject[ ] **ffbObjects** = new GameObject[0]
- Text **objectText**

Protected Member Functions

- void **SetRelevantScripts** (SG_TrackedHand hand, bool active)
- void **SetObject** (int index, bool active)
- int **WrapIndex** (int newIndex)

Protected Attributes

- SG_TrackedHand **activeHand** = null
- SG_Breakable[ ] **breakables** = new SG_Breakable[0]
- int **objIndex** = -1
- bool **allowedSwap** = false
- float **openTime** = 0.2f
- float **openedTimer** = 0
- float **breakableResetTime** = 1.0f
- float **breakableTimer** = 1.0f

Properties

- bool **ButtonsActive** `[get, set]`
- bool **ButtonsInteractable** `[get, set]`

Private Member Functions

- void **ConnectObjects** (SG_TrackedHand hand)
- void **Awake** ()
- void **Start** ()
- void **Update** ()

Private Attributes

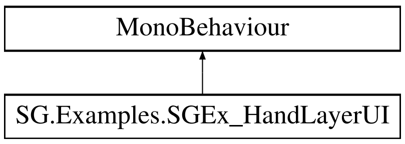
- SG_TrackedHand **rightHand**
- Button **previousButton**

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Examples/Resources/SGEx_↩ ForceFeedbackObjects.cs

5.59 SG.Examples.SGEx_HandLayerUI Class Reference

Inheritance diagram for SG.Examples.SGEx_HandLayerUI:



Public Types

- enum **ShowingLayer** {
  None, **HandModelLayer**, **AnimationLayer**, **FeedbackLayer**,
  GrabLayer, **RigidbodyLayer**, **PhysicsLayer**, **All** }

Public Member Functions

- void **NextStep** ()
- void **PreviousStep** ()
- void **GoToStep** (int index)
- void **SetInstructions** (int index)
- void **SetLayer** (int index)
- void **CalibrateWrist** ()
- void **SetLayerObjects** (int L, bool active)
- void **SetAllObjects** (bool active)
- void **ShowLayer** (ShowingLayer layer)
- void **UpdateOverview** (ShowingLayer layer)

Public Attributes

- Text **instructionsUI**
- Button **prevBtn**
- SG_TrackedHand **leftHand**
- SG_TrackedHand **rightHand**
- KeyCode **nextKey** = KeyCode.D
- KeyCode **prevKey** = KeyCode.A
- KeyCode **wristKey** = KeyCode.P
- int **currStep** = -1
- int **mustConnectStep** = 6
- Button **nextButton**
- Text[ ] **overviewTexts** = new Text[0]
- Color **textHLColor** = Color.white
- Color **textDisabledColor** = Color.gray
- GameObject[ ] **feedbackObjects** = new GameObject[0]
- GameObject[ ] **grabLayerObjects** = new GameObject[0]
- GameObject[ ] **rigidBodyObjects** = new GameObject[0]
- GameObject[ ] **physicsObjects** = new GameObject[0]

Protected Attributes

- ShowingLayer **showing** = ShowingLayer.All
- SG_TrackedHand **activeHand** = null
- string[ ] **instructionTexts**
- ShowingLayer[ ] **linkedLayers**

Private Member Functions

- void **Start** ()
- void **Update** ()

Private Attributes

- Button **nextBtn**
- Button **calibrateWristBtn**
- Button **prevButton**
- GameObject[ ][ ] **layerObjects** = new GameObject[0][ ]

5.59.1 Member Data Documentation

5.59.1.1 instructionTexts

```
string [ ] SG.Examples.SGEx_HandLayerUI.instructionTexts  [protected]
```

Initial value:

```
= new string[]
        {
            "This example will run you through the SenseGlove hand prefab and its different ’layers’",
            "The SenseGlove hand consists of 7 layers: A HandModel, Animator, Feedback Layer, Grab Layer,
       Rigidbody Layer and PhysicsTracking layer.",
            "Each of these layers can be enabled/disabled by turning their gameobjects on/off, either code
       or through the inspector. Nearly all of them can be safely deleted in their entirety if their
       functionality is not required.",
            "The TrackedHand script, attached to the root of the prefab, is your main access point to all
       layers. It can be set to follow a specific GameObject, with preprogrammed offsets for certain
       tracking hardware.",
            "The HandModel layer contains the 3D assets to draw and position the hand. The SG_HandInfo
       script tells the other SenseGlove Scripts where the joints are located.",

            "One can swap out the hand model for another by replacing the HandModel’s children, and
       assigning the proper transforms in the SG_HandInfo script via code or the inspector.",

            "Unless you want to manually set Tracking targets for the colliders of the other layers, the
       SG_HandModelInfo script is the only one that should not be deleted.",
            "The animation layer is responsible for animating the hand using the SG_HandAnimation script. It
       can be disabled if you wish to animate the hand model yourself.",
            "The Feedback layer contains colliders that respond to impacts and to SenseGlove_Material
       Scripts. Each frame, the SG_HandFeedback script collects the appropriate forces and sends these to
       the SenseGlove.",
            "The Grab Layer allows one to pick up and manipulate objects with SG_Interactable scripts. If
       you already have manipulation scripts (such as through VRTK), you can disable this layer and replace
       it with your own.",
            "The Rigidbody layer adds rigidbodies that allow one to push and hold other rigidbody objects.
       This gameobject and its children can be placed on their own layer, or be told to ignore certain
       colliders.",
            "The PhysicsTracking layer contains non-trigger colliders that prevent the SG_TrackedHand from
       passing through non-grabable objects, provided that its ’trackingMethod’ property is set to be
       ’PhysicsBased’.",
             "This separation of layers allows for a hand model that can be adjusted to your needs, and
       which allows different physics behaviours wihout touching the actual 3D Model.",
        }
```

5.59.1.2 linkedLayers

```
ShowingLayer [ ] SG.Examples.SGEx_HandLayerUI.linkedLayers  [protected]
```

Initial value:

```
= new ShowingLayer[]
        {
            ShowingLayer.None,
            ShowingLayer.None,
            ShowingLayer.None,
            ShowingLayer.None,
            ShowingLayer.HandModelLayer,
            ShowingLayer.HandModelLayer,
            ShowingLayer.HandModelLayer,
            ShowingLayer.AnimationLayer,
            ShowingLayer.FeedbackLayer,
            ShowingLayer.GrabLayer,
            ShowingLayer.RigidbodyLayer,
            ShowingLayer.PhysicsLayer,
            ShowingLayer.All,
        }
```

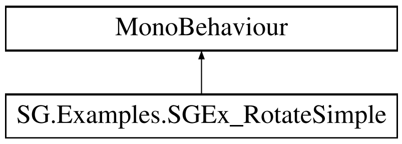
The documentation for this class was generated from the following file:

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Examples/Resources/SGEx_↩ HandLayerUI.cs

5.60 SG.Examples.SGEx_RotateSimple Class Reference

A script to rotate an object around a specified axis

Inheritance diagram for SG.Examples.SGEx_RotateSimple:



Public Member Functions

- void **ResetRotation** ()

Public Attributes

- MovementAxis **moveAround** = MovementAxis.Y
- float **rotationSpeed** = 10f
- bool **resetOnEnable** = false

Properties

- Quaternion **OriginalRotation** `[get, protected set]`

Private Member Functions

- void **Awake** ()
- void **OnEnable** ()
- void **Update** ()

5.60.1 Detailed Description

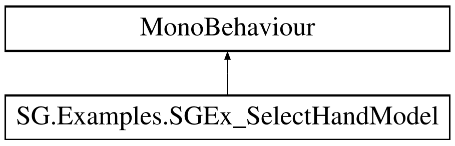
A script to rotate an object around a specified axis

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Examples/Resources/SGEx_↩ RotateSimple.cs

5.61 SG.Examples.SGEx_SelectHandModel Class Reference

Inheritance diagram for SG.Examples.SGEx_SelectHandModel:



Public Member Functions

- void **SetSolver** (SenseGloveCs.Solver solv)
- void **SetModels** (bool left, bool right)

Public Attributes

- SG_SenseGloveHardware **leftGlove**
- KeyCode **swapHandsKey** = KeyCode.Return

Private Member Functions

- void **Start** ()
- void **Update** ()

Private Attributes

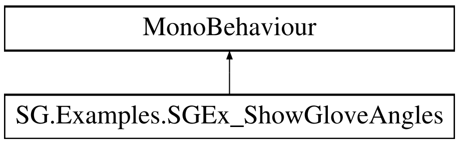
- SG_SenseGloveHardware **rightGlove**
- GameObject **leftHandModel**
- GameObject **rightHandModel**
- bool **leftReady** = false
- bool **rightReady** = false

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Examples/Resources/SGEx_↩ SelectHandModel.cs

5.62 SG.Examples.SGEx_ShowGloveAngles Class Reference

Inheritance diagram for SG.Examples.SGEx_ShowGloveAngles:



Public Attributes

- SG_SenseGloveHardware **senseGlove**
- GridLayoutGroup **angleCanvas**

Private Member Functions

- Text **CreateTextBox** (string textString, Font font, Transform parent, string objName="textBox")
- void **SetupAngleUI** ()
- void **UpdateAngleUI** (float[ ][ ] sensors)
- void **Update** ()

Private Attributes

- Text[ ][ ] **angleBoxes**
- bool **setup** = false

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Examples/Resources/SGEx_↩ ShowGloveAngles.cs

5.63 SG.SG_SnapDropZone.SnapProps Class Reference

Contains parameters that assist in snapping/unsnapping to a SnapZone.

Public Member Functions

- SnapProps (SG_Grabable grabable)

  Create a new instance of SnapProps, based on a singele Grabable's properties.
- void RestoreProperties (SG_Grabable grabable)

  Restore properties back to their original state(s).
- void CreateJoint (SG_Grabable grabable, Rigidbody snapZoneBody, float breakForce)

  Create a Physics Joint between a grabable and a snapZone.
- void BreakJoint ()

  Destroy the PhysicsJoint if it was created in the past.

Public Attributes

- bool wasInteractable

  Determines if this object was Interactable before it snapped to this zone.
- bool wasKinematic

  Determines if the RigidBody was Kinematic before it snapped.
- bool usedGravity

  Determines if the RigidBody used Gravity before it snapped.
- Joint myJoint

  Optional PhysicsJoint that is created if the Object is picked up using FixedJoints.
- Transform oldParent = null

  The old parent of the object
- bool isSnapped = false

  Lets the zone know if this object has snapped yet. False by default.

5.63.1 Detailed Description

Contains parameters that assist in snapping/unsnapping to a SnapZone.

Placed inside a class to reduce the amount of List<> parameters.

5.63.2 Constructor & Destructor Documentation

5.63.2.1 SnapProps()

```
SG.SG_SnapDropZone.SnapProps.SnapProps (
             SG_Grabable grabable )
```

Create a new instance of SnapProps, based on a singele Grabable's properties.

Parameters

grabable	

5.63.3 Member Function Documentation

5.63.3.1 BreakJoint()

```
void SG.SG_SnapDropZone.SnapProps.BreakJoint ( )
```

Destroy the PhysicsJoint if it was created in the past.

5.63.3.2 CreateJoint()

```
void SG.SG_SnapDropZone.SnapProps.CreateJoint (
             SG_Grabable grabable,
             Rigidbody snapZoneBody,
             float breakForce )
```

Create a Physics Joint between a grabable and a snapZone.

Parameters

grabable	
snapZoneBody	
breakForce	

5.63.3.3 RestoreProperties()

```
void SG.SG_SnapDropZone.SnapProps.RestoreProperties (
            SG_Grabable grabable )
```

Restore properties back to their original state(s).

Parameters

grabable	

5.63.4 Member Data Documentation

5.63.4.1 isSnapped

```
bool SG.SG_SnapDropZone.SnapProps.isSnapped = false
```

Lets the zone know if this object has snapped yet. False by default.

5.63.4.2 myJoint

```
Joint SG.SG_SnapDropZone.SnapProps.myJoint
```

Optional PhysicsJoint that is created if the Object is picked up using FixedJoints.

5.63.4.3 oldParent

```
Transform SG.SG_SnapDropZone.SnapProps.oldParent = null
```

The old parent of the object

5.63.4.4 usedGravity

```
bool SG.SG_SnapDropZone.SnapProps.usedGravity
```

Determines if the RigidBody used Gravity before it snapped.

5.63.4.5 wasInteractable

```
bool SG.SG_SnapDropZone.SnapProps.wasInteractable
```

Determines if this object was Interactable before it snapped to this zone.

5.63.4.6 wasKinematic

```
bool SG.SG_SnapDropZone.SnapProps.wasKinematic
```

Determines if the RigidBody was Kinematic before it snapped.

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

- D:/Gitlab/SenseGloveAPI/Unity/SG_UnityPlugin_v1/Assets/SenseGlove/Scripts/Controls/SG_SnapDrop↩ Zone.cs

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