



## Let's make UnityEvent more handy.

- Are you using UnityEvent with UGUI? It's kinda handy for me, but...
- It only allows one parameter of few types, and doesn't support static methods.
- And we can't reorder it, nor pick one of the same type components on an object.
- However, I'd like to enhance it, instead of finding a new event system.

## Overview:

- Support static methods and multiple parameters or array of common **types**.
- Design as a component for storing the parameters and reusing the settings.
- Include a PropertyAttribute to specify one of multiple components easily.
- Make UnityEvent draggable and support picking from the same type components.

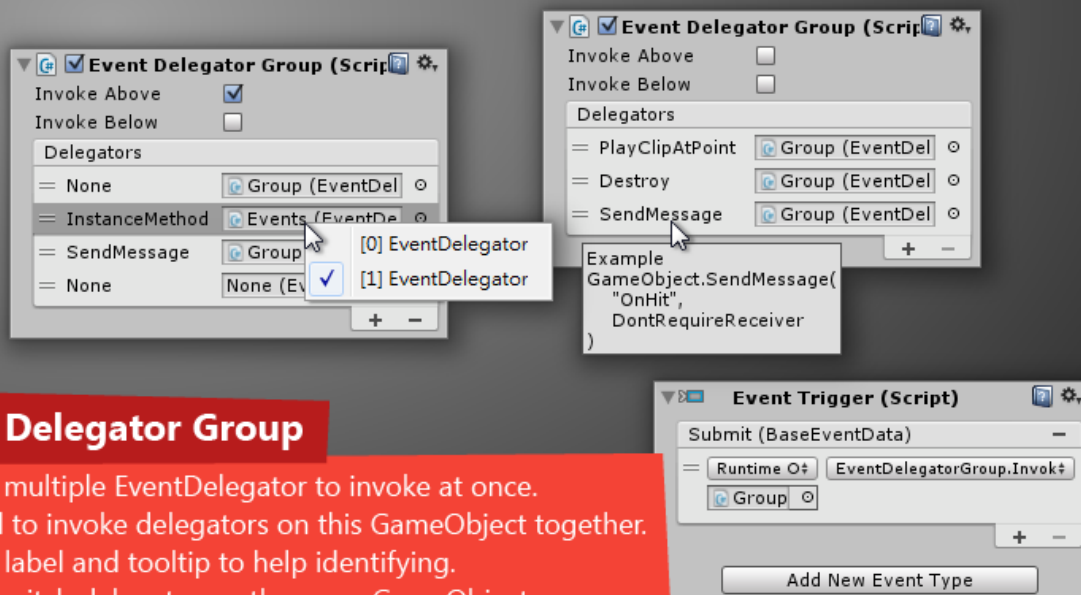
The further technical documentation is available [here](#).

And the operation manual is right below.

## Using:

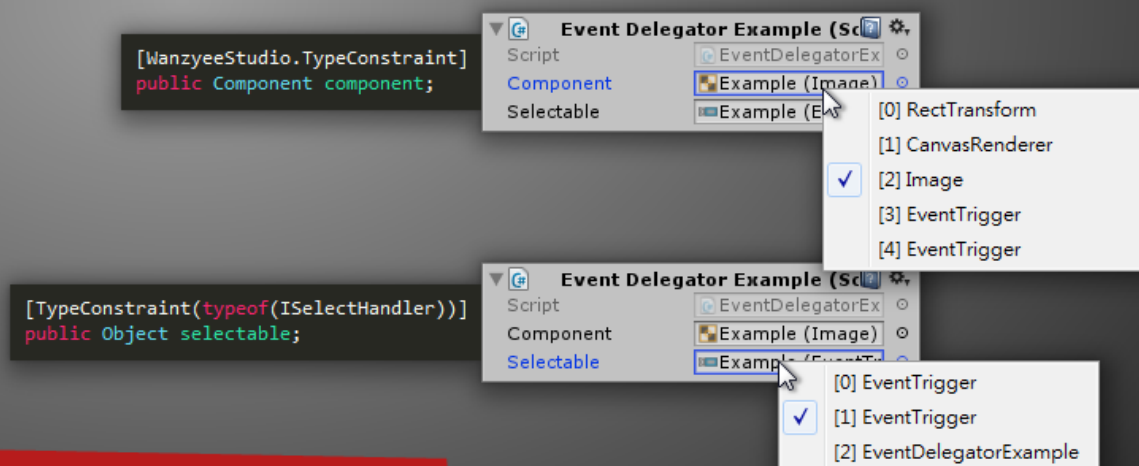
**Event Delegator**

Popup menu to select a method of the instance.  
Support static method if the instance none.  
Support multiple parameters or array of editable types.  
Able to switch component by right clicking in the field.  
Easy to assign to UnityEvent with the Invoke() method.



## Event Delegator Group

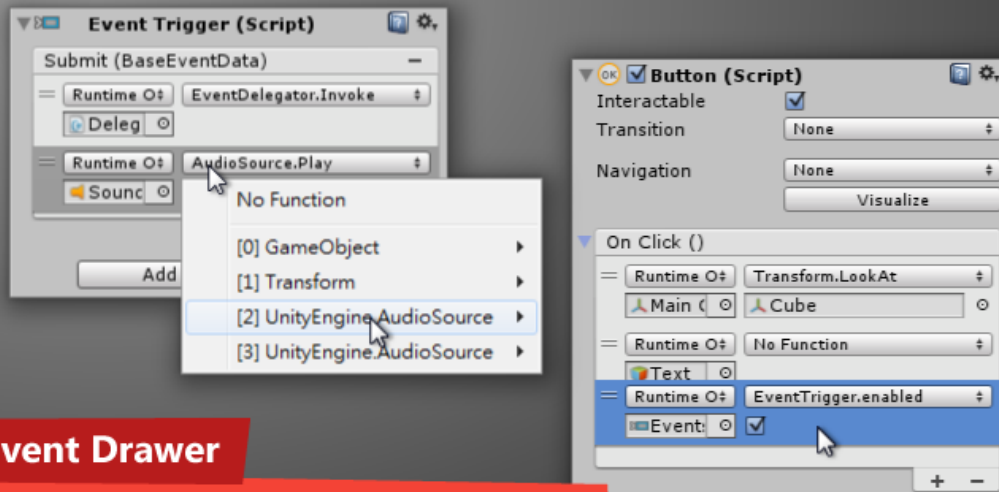
Arrange multiple EventDelegator to invoke at once.  
Optional to invoke delegators on this GameObject together.  
Element label and tooltip to help identifying.  
Able to switch delegator on the same GameObject.  
Easy to assign to UnityEvent with the Invoke() method.



## Type Constraint Attribute

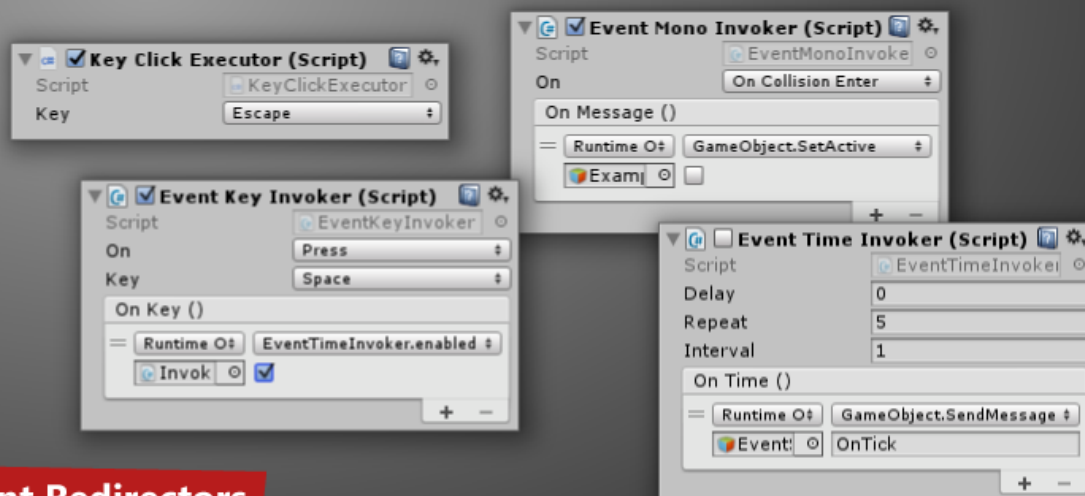
Switch specified type Component on a GameObject by right clicking in the field.  
Support multiple components of the same type.  
Support to filter the interface when selecting or dragging.

## Add-on:



### UnityEvent Drawer

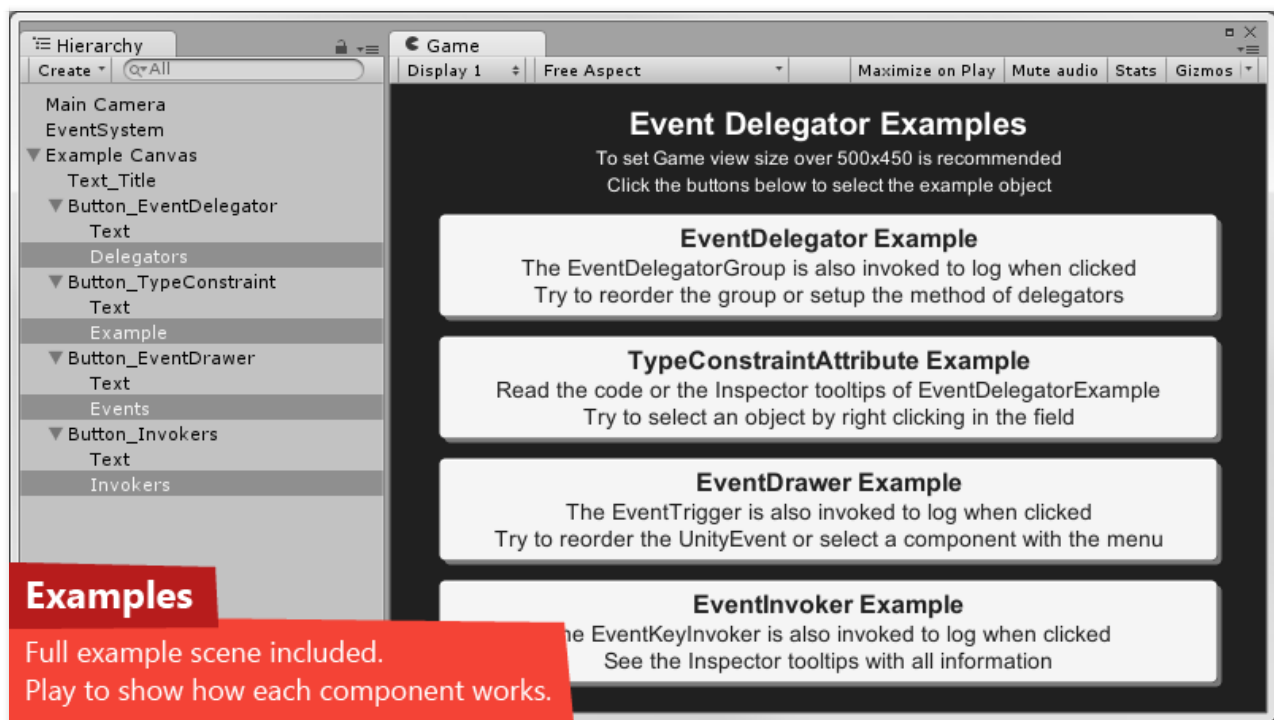
Auto apply to the built-in UnityEvent.  
Make it draggable and foldable.  
Able to select from components of the same type.  
This uses C# Reflection and works until Unity changes.



### Event Redirectors

KeyClickExecutor clicks an UGUI Button by key press, e.g., mobile back button.  
Simple Invokers to trigger UnityEvent, convenient for testing or prototype.

## Examples:



## Release:



### 1.0.5

- Provide assembly definition files, please be aware the script files were moved therefore.
- New, add-on **KeyClickExecutor** to receive key press to click an UGUI object.
- New, support to fold or expand the UnityEvent in the Inspector.
- Refactor the editor of **EventDelegator** to initialize faster.
- Fix the tooltip in a EventDelegatorGroup to show a delegator's invoking detail.

### 1.0.4

- Refactoring.
- Move the example scene to a sub folder.

### 1.0.3

- Change some message methods in **EventMonoInvoker** according specified platform.

### 1.0.2

- New, add-on **RaycastMaskFilter** to make non-rectangle UGUI button.
- New, add-on **RaycastVisibilityFilter** to block clicking a button when it's partially hidden.

### 1.0.1

- Change some message methods in EventMonoInvoker according to the new API.

### 1.0

- First release.

# ReorderableListExpander

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Editor AiderReleased Packages » |  
Event DelegatorReleased Packages » | [Shortcut](#)

Helper to make a `UnityEditorInternal.ReorderableList` foldable. [More...](#)

## Static Public Member Functions

static ReorderableList	<b>Create</b>	(SerializedProperty property, ReorderableList.ElementCallbackDelegate drawElementCallback=null, ReorderableList.ElementHeightCallbackDelegate elementHeightCallback=null) Create a <code>UnityEditorInternal.ReorderableList</code> with common settings. <a href="#">More...</a>
static void	<b>Wrap</b>	(ReorderableList list) Wrap the specified list's layout callbacks and settings to support folding. <a href="#">More...</a>

## Detailed Description

Helper to make a `UnityEditorInternal.ReorderableList` foldable.

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## Member Function Documentation

static	
ReorderableList	
Create	( SerializedProperty property, ReorderableList.ElementCallbackDelegate drawElementCallback = null, ReorderableList.ElementHeightCallbackDelegate elementHeightCallback = null )

Create a `UnityEditorInternal.ReorderableList` with common settings.  
I.e., the property label as the header, click to fold or expand the list, basic add and remove buttons.

**Returns**  
The reorderable list.

**Parameters**  
**property** Property.  
**drawElementCallback** Draw element callback.  
**elementHeightCallback** Element height callback.

## static void Wrap ( ReorderableList list )

static

Wrap the specified list's layout callbacks and settings to support folding.

This only supports a list with `ReorderableList.serializedProperty`. And draw the header with the property name and tooltip if no `ReorderableList.drawHeaderCallback`.

### Parameters

**list** List.

# EditrixGUI

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[Event DelegatorReleased Packages](#) » |

[NotebookReleased Packages](#) » | [Shortcut](#)

Include some convenient methods for editor GUI. [More...](#)

## Static Public Member Functions

static float	<b><a href="#">GetLabelWidth</a></b> (float viewWidth=0f) Get the label width within the specified view width. <a href="#">More...</a>
static void	<b><a href="#">SetIconForObject</a></b> (Object obj, Texture2D icon) Set the icon for the specified <code>UnityEngine.Object</code> to show in the Inspector or Project window. <a href="#">More...</a>
static void	<b><a href="#">MultiFloatField</a></b> (GUIContent label, GUIContent[] subLabels, float[] values, params GUILayoutOption[] options) Make a multi-control with text fields for entering multiple floats in the same line. <a href="#">More...</a>
static Vector4	<b><a href="#">Vector4Field</a></b> (GUIContent label, Vector4 value, params GUILayoutOption[] options) Make an X, Y, Z and W field for entering a <code>UnityEngine.Vector4</code> . <a href="#">More...</a>
static Quaternion	<b><a href="#">QuaternionField</a></b> (GUIContent label, Quaternion value, params GUILayoutOption[] options) Make an X, Y, Z and W field for entering a <code>UnityEngine.Quaternion</code> . <a href="#">More...</a>
static string	<b><a href="#">SearchField</a></b> (string text, Action onPopup=null, params GUILayoutOption[] options) Make a toolbar style search field, optional to set a callback invoked when click the magnifier popup icon. <a href="#">More...</a>
static void	<b><a href="#">ErrorField</a></b> (Rect position, GUIContent label, GUIContent error) Display an error message after the prefix label. <a href="#">More...</a>
static Object[]	<b><a href="#">CheckDragObjects</a></b> (Func< Object, bool > filter) Check if Drag'n'Drop performed with the filtered dragged <code>UnityEngine.Object</code> references. <a href="#">More...</a>
static Object[]	<b><a href="#">CheckDragObjects</a></b> (Func< IEnumerable< Object >, IEnumerable< Object >> filter=null) Check if Drag'n'Drop performed with the filtered dragged <code>UnityEngine.Object</code> references. <a href="#">More...</a>
static string[]	<b><a href="#">CheckDragPaths</a></b> (Func< string, bool > filter) Check if Drag'n'Drop performed with the filtered dragged <code>string</code> paths. <a href="#">More...</a>
static string[]	<b><a href="#">CheckDragPaths</a></b> (Func< IEnumerable< string >, IEnumerable< string >> filter=null) Check if Drag'n'Drop performed with the filtered dragged <code>string</code> paths. <a href="#">More...</a>

## Detailed Description

Include some convenient methods for editor GUI.

3

## Member Function Documentation

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**static float GetLabelWidth ( float viewWidth = 0f )**

static

Get the label width within the specified view width.

Commonly used for a prefix label in a resizable window. Use `EditorGUIUtility.currentViewWidth` instead if not assign.

### Returns

The label width.

### Parameters

**viewWidth** View width.

**static void SetIconForObject ( Object obj,  
Texture2D icon  
)**

static

Set the icon for the specified `UnityEngine.Object` to show in the Inspector or Project window.

This wraps the internal `EditorGUIUtility.SetIconForObject()`:

1. It applies to all the same type objects, also the `UnityEditor.MonoScript` declares the type.
2. You may pass the script asset to set without any object instance.
3. To restore to default, pass a `null` icon.

The opposite methods below to get the icon:

1. `AssetPreview.GetMiniThumbnail()` to get by `UnityEngine.Object`.
2. `AssetPreview.GetMiniTypeThumbnail()` to get by `System.Type`.
3. `EditorGUIUtility.ObjectContent()` to get by both.

### Parameters

**obj** Object.

**icon** Icon.



```
static void MultiFloatField ( GUIContent label,
                             GUIContent[] subLabels,
                             float[] values,
                             params GUILayoutOption[] options
                             )
```

static

Make a multi-control with text fields for entering multiple floats in the same line.

Wrap `EditorGUI.MultiFloatField()` as the GUI layout automatically.

#### Parameters

**label** Main label.  
**subLabels** Sub labels.  
**values** Values.  
**options** Layout options.

```
static Vector4 Vector4Field ( GUIContent label,
                             Vector4 value,
                             params GUILayoutOption[] options
                             )
```

static

Make an X, Y, Z and W field for entering a `UnityEngine.Vector4`.

Copycat of `EditorGUILayout.Vector4Field()` but use **`MultiFloatField()`**. Contrast to original, this correct line wrap and indent level.

#### Returns

The new value.

#### Parameters

**label** Label.  
**value** Value.  
**options** Layout options.

```
static Quaternion QuaternionField ( GUIContent label,
                                   Quaternion value,
                                   params GUILayoutOption[] options
                                   )
```

static

Make an X, Y, Z and W field for entering a `UnityEngine.Quaternion`.

Just looks like `Vector4Field()`.

### Returns

The new value.

### Parameters

**label** Label.

**value** Value.

**options** Layout options.

```
static string SearchField ( string text,
                           Action onPopup = null,
                           params GUILayoutOption[] options
                           )
```

static

Make a toolbar style search field, optional to set a callback invoked when click the magnifier popup icon.

### Returns

The new text.

### Parameters

**text** The text to edit.

**onPopup** The popup callback.

**options** Layout options.

```
static void ErrorField ( Rect          position,
                        GUIContent label,
                        GUIContent error
                      )
```

static

Display an error message after the prefix label.

#### Parameters

**position** Position.

**label** Label.

**error** Error message.

```
static Object [] CheckDragObjects ( Func< Object, bool > filter )
```

static

Check if Drag'n'Drop performed with the filtered dragged `UnityEngine.Object` references.

#### Returns

The filtered objects, only valid when drag performed, otherwise `null`.

#### Parameters

**filter** The callback invoked to filter each object only when drag updated.

```
static Object []
```

```
CheckDragObjects ( Func< IEnumerable< Object >, IEnumerable< Object >> filter = null )
```

static

Check if Drag'n'Drop performed with the filtered dragged `UnityEngine.Object` references.

#### Returns

The filtered objects, only valid when drag performed, otherwise `null`.

#### Parameters

**filter** The callback invoked to filter all objects only when drag updated.

```
static string [] CheckDragPaths ( Func< string, bool > filter )
```

static

Check if Drag'n'Drop performed with the filtered dragged `string` paths.

#### Returns

The filtered paths, only valid when drag performed, otherwise `null`.

#### Parameters

**filter** The callback invoked to filter each path only when drag updated.

**static string []**

**CheckDragPaths** ( Func< IEnumerable< string >, IEnumerable< string >> filter = null )

static

Check if Drag'n'Drop performed with the filtered dragged `string` paths.

**Returns**

The filtered paths, only valid when drag performed, otherwise `null`.

**Parameters**

**filter** The callback invoked to filter all paths only when drag updated.

# EditrixUtility

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» | [Event DelegatorReleased Packages](#) » |

[NotebookReleased Packages](#) » | [Shortcut](#)

Include some convenient methods for editor or asset operation. [More...](#)

## Static Public Member Functions

static Object[]	<b>GetAllAssets</b> (bool progressBar=false) Get all main assets in the project folder. <a href="#">More...</a>
static string[]	<b>GetAllAssetLabels</b> (params Object[] assets) Get all asset labels used in project, or only find the ones used by assigned assets. <a href="#">More...</a>
static T[]	<b>LoadAssets&lt; T &gt;</b> (string filter=null, params string[] searchInFolders) Load all specified type assets with the search filter in the folders. <a href="#">More...</a>
static bool	<b>OpenAsset&lt; T &gt;</b> (int instanceID, Action< T > handler) Common template method to open an asset. <a href="#">More...</a>
static string	<b>GetObjectOrder</b> (Object source, bool assetFirst=true) Get an order <i>string</i> of given object for sorting. <a href="#">More...</a>
static bool	<b>CheckIoCreatable</b> (string path, bool overwrite=false, bool exception=false) Determine if the path can be used to create a file or directory. <a href="#">More...</a>
static IEnumerable< Type >	<b>GetExposingTypes</b> (bool editor=false) Get types appropriate to expose in the Inspector to select members, optional to include editor types. <a href="#">More...</a>

## Events

static EditorApplication.CallbackFunction	<b>playmodeChanged</b> = () => {} Callback of play mode state changed event, for compatibility before Unity 2017.2. <a href="#">More...</a>
static Action	<b>projectChanged</b> = () => {} Callback of project changed event, for compatibility before Unity 2018.1. <a href="#">More...</a>
static Action	<b>hierarchyChanged</b> = () => {} Callback of hierarchy changed event, for compatibility before Unity 2018.1. <a href="#">More...</a>

## Detailed Description

Include some convenient methods for editor or asset operation.

## Member Function Documentation

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**static Object [] GetAllAssets ( bool progressBar = false )**

static

Get all main assets in the project folder.

### Returns

The all assets.

### Parameters

**progressBar** If set to `true` show progress bar while scanning.

**static string [] GetAllAssetLabels ( params Object[] assets )**

static

Get all asset labels used in project, or only find the ones used by assigned assets.

### Returns

The asset labels.

### Parameters

**assets** Assets.

**static T [] LoadAssets< T > ( string filter = null,  
params string[] searchInFolders  
)**

static

Load all specified type assets with the search filter in the folders.

### Returns

The assets.

### Parameters

**filter** The filter string can contain search data.

**searchInFolders** The folders where the search will start.

### Template Parameters

**T** The asset type.

### Type Constraints

*T : Object*

```
static bool OpenAsset< T > ( int          instanceID,  
                           Action< T > handler  
                           )
```

static

Common template method to open an asset.

Basically for usage of `UnityEditor.Callbacks.OnOpenAssetAttribute`.

### Returns

`true`, if handled the opening of the asset.

### Parameters

**instanceID** Instance ID.

**handler** Callback to open the asset.

### Template Parameters

**T** Asset type.

### Type Constraints

*T : Object*

```
static string GetObjectOrder ( Object source,  
                             bool   assetFirst = true  
                             )
```

static

Get an order `string` of given object for sorting.

It's asset path, append with sibling if relative to `UnityEngine.GameObject`. Optional to sort asset or hierarchy object first.

### Returns

The order.

### Parameters

**source** Source object.

**assetFirst** If set to `true` asset first.

```
static bool CheckloCreatable ( string path,
                                bool  overwrite = false,
                                bool  exception = false
                                )
```

static

Determine if the path can be used to create a file or directory.

Optional to throw an exception message or just return `false` if invalid. Check `IoUtility.CheckCreatable()` at the first. Then return `true` if the file doesn't exist yet or force to `overwrite`. Otherwise popup a dialog for the user to make the decision.

### Returns

`true` if is creatable; otherwise, `false`.

### Parameters

**path** Path.

**overwrite** Overwrite.

**exception** Flag to throw an exception or return `false`.

```
static IEnumerable<Type> GetExposingTypes ( bool editor = false )
```

static

Get types appropriate to expose in the Inspector to select members, optional to include editor types.

Include types from Unity and assemblies in the project folder. And what excluded is non-public, interface, enum, array or generic types.

### Returns

The types.

### Parameters

**editor** If set to `true` include editor types.

## Event Documentation

```
EditorApplication.CallbackFunction playmodeChanged = () => {}
```

static

Callback of play mode state changed event, for compatibility before Unity 2017.2.

```
Action projectChanged = () => {}
```

static

Callback of project changed event, for compatibility before Unity 2018.1.



**Action** hierarchyChanged = () => {}

static

Callback of hierarchy changed event, for compatibility before Unity 2018.1.

# MenuExtension

[Released Packages](#) » [3P MakerReleased Packages](#) » |

[ClipboardReleased Packages](#) » | [Editor AiderReleased Packages](#)

» | [Event DelegatorSpecific Classes](#) » |

[ExtensionsReleased Packages](#) » | [NotebookReleased Packages](#)

» | [Shortcut](#)

**Extension** methods for `UnityEditor.GenericMenu`. [More...](#)

## Static Public Member Functions

static void **AddItem< T >** (this GenericMenu menu, string content, Action< T > func, T param, bool check=false, bool enable=true)  
Add an item to the menu, it will be disabled if the function isn't assigned. [More...](#)

static void **AddItem** (this GenericMenu menu, string content, Action func=null, bool check=false, bool enable=true)  
Add an item to the menu, it will be disabled if the function isn't assigned. [More...](#)

## Detailed Description

**Extension** methods for `UnityEditor.GenericMenu`.

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## Member Function Documentation

```
static void AddItem< T > ( this GenericMenu menu,
                        string          content,
                        Action< T >     func,
                        T               param,
                        bool            check = false,
                        bool            enable = true
                        )
```

static

Add an item to the menu, it will be disabled if the function isn't assigned.

### Parameters

**menu** Menu.

**content** Content.

**func** The function to call when the menu item is selected.

**param** The parameter to pass to the function.

**check** Whether to show the item is currently activated.

**enable** If set to `false` to enforce disabled.

### Template Parameters

**T** The parameter type.

```
static void AddItem ( this GenericMenu menu,
                    string          content,
                    Action          func = null,
                    bool            check = false,
                    bool            enable = true
                    )
```

static

Add an item to the menu, it will be disabled if the function isn't assigned.

### Parameters

**menu** Menu.

**content** Content.

**func** The function to call when the menu item is selected.

**check** Whether to show the item is currently activated.

**enable** If set to `false` to enforce disabled.

# PropertyExtension

Released Packages » 3P MakerReleased Packages » |  
Editor AiderReleased Packages » |  
Event DelegatorSpecific Classes » |  
ExtensionsReleased Packages » | [Shortcut](#)

**Extension** methods for `UnityEditor.SerializedProperty`. [More...](#)

## Static Public Member Functions

static void	<b>CheckValid</b> (this SerializedProperty property)	Check if the property, serializedObject, and targetObject, all exist, otherwise throw an exception. <a href="#">More...</a>
static SerializedProperty	<b>GetParent</b> (this SerializedProperty property)	Get the parent <code>UnityEditor.SerializedProperty</code> contains this. <a href="#">More...</a>
static string	<b>GetTooltip</b> (this SerializedProperty property)	Get the tooltip of the property, return <code>string.Empty</code> if none. <a href="#">More...</a>
static void	<b>CheckArray</b> (this SerializedProperty property)	Check if the property is a valid array property. <a href="#">More...</a>
static SerializedProperty	<b>Insert</b> (this SerializedProperty property, int index=-1, bool copy=false)	Insert an array element at the specified index and return it. <a href="#">More...</a>
static void	<b>AddRange</b> (this SerializedProperty property, IEnumerable< Object > collection)	Add the source <code>collection</code> to the array property. <a href="#">More...</a>

## Detailed Description

**Extension** methods for `UnityEditor.SerializedProperty`.

3

## Member Function Documentation

static void CheckValid ( this SerializedProperty property )

static

Check if the property, serializedObject, and targetObject, all exist, otherwise throw an exception.

**Parameters**  
property Property.

### static SerializedProperty GetParent ( this SerializedProperty property )

static

Get the parent `UnityEditor.SerializedProperty` contains this.

Return `null` if this is a root within target object.

#### Returns

The parent.

#### Parameters

**property** Property.

### static string GetTooltip ( this SerializedProperty property )

static

Get the tooltip of the property, return `string.Empty` if none.

The built-in `SerializedProperty.tooltip` never works with unknown reason. This uses `EditorGUI.BeginProperty()` to fetch the tooltip, must be called in `OnGUI()`.

#### Returns

The tooltip.

#### Parameters

**property** Property.

### static void CheckArray ( this SerializedProperty property )

static

Check if the property is a valid array property.

#### Parameters

**property** Property.

```
static SerializedProperty Insert ( this SerializedProperty property,
                                int index = -1,
                                bool copy = false
                                )
```

static

Insert an array element at the specified index and return it.

Optional to copy values from the original element at the index, like the Unity's default behavior. Otherwise Leave all the values empty.

### Returns

Element property.

### Parameters

**property** Property.

**index** Index.

**copy** If set to `true` copy.

```
static void AddRange ( this SerializedProperty property,
                      IEnumerable< Object > collection
                      )
```

static

Add the source `collection` to the array property.

### Parameters

**property** Property.

**collection** Collection.

# EventDelegatorGroup

[Specific Classes](#) » [Components](#)[Released Packages](#) » |

[Event Delegator](#)

Group and reorder multiple [EventDelegator](#) to invoke at once. [More...](#)

Inherits MonoBehaviour.

## Public Member Functions

[EventDelegator](#)[] **GetDelegators** ()

Get all the [EventDelegator](#), include which attached above and below if checked.

[More...](#)

void **Invoke** ()

Invoke each [EventDelegator](#) of this in turn if enabled. [More...](#)

## Public Attributes

bool **invokeAbove**

Flag if to invoke each [EventDelegator](#) attached above before this's delegators.

[More...](#)

bool **invokeBelow**

Flag if to invoke each [EventDelegator](#) attached below after this's delegators.

[More...](#)

[EventDelegator](#)[] **delegators** = {}

All the [EventDelegator](#) to invoke in turn between others above and below. [More...](#)

## Detailed Description

Group and reorder multiple [EventDelegator](#) to invoke at once.

## Member Function Documentation

[EventDelegator](#) [] **GetDelegators** ( )

Get all the [EventDelegator](#), include which attached above and below if checked.

### Returns

The delegators.

**void Invoke ( )**

Invoke each **EventDelegator** of this in turn if enabled.

## Member Data Documentation

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**bool invokeAbove**

Flag if to invoke each **EventDelegator** attached above before this's delegators.

**bool invokeBelow**

Flag if to invoke each **EventDelegator** attached below after this's delegators.

**EventDelegator [] delegators = {}**

All the **EventDelegator** to invoke in turn between others above and below.



# EventMonoInvoker

[Specific Classes](#) » [Components](#)[Released Packages](#) » |

[Event Delegator](#)

Invoke event methods by specified `UnityEngine.MonoBehaviour` `message`. [More...](#)

Inherits `MonoBehaviour`.

## Public Member Functions

void **Invoke** ()

Invoke the event listener methods. [More...](#)

## Public Attributes

**MonoMessage** `on` = **MonoMessage.Awake**

The `UnityEngine.MonoBehaviour` `message` to invoke. [More...](#)

UnityEvent **onMessage** = new UnityEvent()

The event listener methods to invoke. [More...](#)

## Detailed Description

Invoke event methods by specified `UnityEngine.MonoBehaviour` `message`.

## Member Function Documentation

void **Invoke** ( )

Invoke the event listener methods.

## Member Data Documentation

**MonoMessage** `on` = **MonoMessage.Awake**

The `UnityEngine.MonoBehaviour` `message` to invoke.

**UnityEvent onMessage = new UnityEvent()**

The event listener methods to invoke.

# EventTimeInvoker

[Specific Classes](#) » [Components](#)[Released Packages](#) » |  
[Event Delegator](#)

Invoke event methods by delay and repeat time. [More...](#)

Inherits MonoBehaviour.

## Public Member Functions

void **Invoke** ()  
Invoke the event listener methods. [More...](#)

## Public Attributes

float **delay**  
The delay time to invoke after enabled. [More...](#)

int **repeat** = 1  
The repeat count to invoke, 0 means unlimited. [More...](#)

float **interval** = 1f  
The interval between repeat invoke. [More...](#)

UnityEvent **onTime** = new UnityEvent()  
The event listener methods to invoke. [More...](#)

## Detailed Description

Invoke event methods by delay and repeat time.

## Member Function Documentation

**void Invoke ( )**

Invoke the event listener methods.

## Member Data Documentation

**float delay**

The delay time to invoke after enabled.

**int repeat = 1**

The repeat count to invoke, 0 means unlimited.

**float interval = 1f**

The interval between repeat invoke.

**UnityEvent onTime = new UnityEvent()**

The event listener methods to invoke.

# KeyClickExecutor

[Specific Classes](#) » [Components](#)[Released Packages](#) » |  
[Event Delegator](#)

Execute click event on this object when the center touchable and the specified key pressed. [More...](#)

Inherits MonoBehaviour.

## Public Attributes

KeyCode **key** = KeyCode.Escape

The input key to listen. [More...](#)

## Detailed Description

Execute click event on this object when the center touchable and the specified key pressed.

Usage example, redirect the mobile back button, i.e., "Esc" key, to a UI button. This executes all `UnityEngine.EventSystems.IPointerClickHandler` attached together.

## Member Data Documentation

**KeyCode key = KeyCode.Escape**

The input key to listen.

# RaycastMaskFilter

[Specific Classes](#) » [Components](#)[Released Packages](#) » | [Event Delegator](#)

Filter raycasts by a mask `UnityEngine.Texture2D` for non-rectangle area of effect. [More...](#)

Inherits `MonoBehaviour`, and `ICanvasRaycastFilter`.

## Public Member Functions

bool **IsRaycastLocationValid** (Vector2 sp, Camera eventCamera)

Check if the raycast valid, i.e., the hit mask pixel is over the `threshold`. [More...](#)

## Public Attributes

Texture2D **mask**

The readable `UnityEngine.Texture2D` as the filter mask. [More...](#)

**ColorChannel** **channel** = **ColorChannel.A**

The channel to read the mask pixels. [More...](#)

float **threshold**

The minimum pixel value to pass raycasts. [More...](#)

bool **reverse**

The flag to reverse the `threshold` as maximum. [More...](#)

## Detailed Description

Filter raycasts by a mask `UnityEngine.Texture2D` for non-rectangle area of effect.

## Member Function Documentation

```
bool IsRaycastLocationValid ( Vector2 sp,  
                             Camera eventCamera  
                             )
```

Check if the raycast valid, i.e., the hit `mask pixel` is over the `threshold`.

### Returns

`true` if raycast valid; otherwise, `false`.

### Parameters

**sp** Screen position.

**eventCamera** Raycast camera.

## Member Data Documentation

---

### Texture2D mask

The readable `UnityEngine.Texture2D` as the filter mask.

### ColorChannel channel = ColorChannel.A

The channel to read the mask pixels.

### float threshold

The minimum pixel value to pass raycasts.

### bool reverse

The flag to reverse the `threshold` as maximum.

# RaycastVisibilityFilter

[Specific Classes](#) » [Components](#)[Released Packages](#) » | [Event Delegator](#)

Filter raycasts by the `alpha` and `proportion` inside the viewport. [More...](#)

Inherits `MonoBehaviour`, and `ICanvasRaycastFilter`.

## Public Member Functions

bool **IsRaycastLocationValid** (Vector2 sp, Camera eventCamera)

Check if the raycast valid, i.e., the `visibility` is over the `threshold`. [More...](#)

## Public Attributes

RectTransform **viewport**

The viewport contains this to calculate the proportion. [More...](#)

float **threshold**

The minimum visibility to pass raycasts. [More...](#)

int **sample** = 10

The sampling frequency to calculate the proportion when this rotates relative to the viewport. [More...](#)

## Properties

Graphic **graphic** [get]

Get the `UnityEngine.UI.Graphic` with this, throw exception if none. [More...](#)

float **alpha** [get]

Get the alpha of the `UnityEngine.UI.Graphic` with this. [More...](#)

float **proportion** [get]

Get the `UnityEngine.RectTransform` proportion inside the viewport. [More...](#)

float **visibility** [get]

Get the visibility, i.e., the `alpha` multiply the `proportion`. [More...](#)

## Detailed Description

Filter raycasts by the `alpha` and `proportion` inside the viewport.

## Member Function Documentation



```
bool IsRaycastLocationValid ( Vector2 sp,  
                             Camera eventCamera  
                             )
```

Check if the raycast valid, i.e., the visibility is over the threshold.

### Returns

true if raycast valid; otherwise, false.

### Parameters

**sp** Screen position.

**eventCamera** Raycast camera.

## Member Data Documentation

---

### RectTransform viewport

The viewport contains this to calculate the proportion.

### float threshold

The minimum visibility to pass raycasts.

### int sample = 10

The sampling frequency to calculate the proportion when this rotates relative to the viewport.

## Property Documentation

---

### Graphic graphic

get

Get the `UnityEngine.UI.Graphic` with this, throw exception if none.

The graphic component.

### float alpha

[get](#)

Get the alpha of the `UnityEngine.UI.Graphic` with this.

The alpha.

### float proportion

[get](#)

Get the `UnityEngine.RectTransform` proportion inside the viewport.

Use parent `UnityEngine.UI.Mask` or `UnityEngine.Canvas` instead of viewport if not set. Or return 0 if there's none of the above.

The proportion.

### float visibility

[get](#)

Get the visibility, i.e., the alpha multiply the proportion.

Only valid when the `graphic` is active and enabled in the hierarchy, otherwise return 0.

The visibility.

# IoUtility

[Released Packages](#) » [3P MakerReleased Packages](#) » |

[ClipboardReleased Packages](#) » | [Editor AiderReleased Packages](#)

» | [Event DelegatorReleased Packages](#) » |

[NotebookReleased Packages](#) » | [ShortcutReleased Packages](#) » |

[Www Loader](#)

Include some convenient methods to extend IO operation. [More...](#)

## Static Public Member Functions

static string[]	<b>GetDeepFiles</b> (params string[] paths)
	Filter to get the paths of all files and files in directories except "*.meta". <a href="#">More...</a>
static void	<b>Delete</b> (string path, bool ancestor=false)
	Try to delete a file or directory at the specified path. <a href="#">More...</a>
static bool	<b>CheckCreatable</b> (string path, bool exception=false)
	Determine if the path can be used to create a file or directory. <a href="#">More...</a>

## Detailed Description

Include some convenient methods to extend IO operation.

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## Member Function Documentation

static string [] GetDeepFiles ( params string[] paths )

static

Filter to get the paths of all files and files in directories except "\*.meta".

### Returns

The file paths.

### Parameters

**paths** Paths.

```
static void Delete ( string path,
                    bool  ancestor = false
                    )
```

static

Try to delete a file or directory at the specified path.

This doesn't work in Web Player. **Note**, the operation is permanently and irreversibly. Optional to trace and delete ancestor directories if became empty.

#### Parameters

**path** Path.

**ancestor** If set to `true` delete ancestor directories if empty.

```
static bool CheckCreatable ( string path,
                             bool  exception = false
                             )
```

static

Determine if the path can be used to create a file or directory.

Optional to throw an exception message or just return `false` if invalid. A legal path might not be in good format, e.g., "C:dir\ //file" or "\pc\share\new.txt". But it's safe to pass to `Directory` or `FileInfo` to create. Path in situations below is invalid, even dangerous:

1. Nothing but empty or white-spaces, nowhere to go.
2. Starts with 3 slashes, this causes crash while system looking for parent directories.
3. Includes invalid chars, can't name a file.
4. A name in path starts or ends with space, we can't get the created file, even delete.

#### Returns

`true` if is creatable; otherwise, `false`.

#### Parameters

**path** Path.

**exception** Flag to throw an exception or return `false`.

# ComponentExtension

[Released Packages » ClipboardReleased Packages »](#) |

[Event DelegatorSpecific Classes »](#) | [Extensions](#)

**Extension** methods for `UnityEngine.Component`. [More...](#)

## Static Public Member Functions

static string **GetPath** (this Transform transform, string separator="/")  
Get the hierarchy path, used for log or `GameObject.Find()` with the default separator.  
[More...](#)

static Quaternion **TransformQuat** (this Transform transform, Quaternion rotation)  
Transforms rotation from local space to world space. [More...](#)

static Quaternion **InverseTransformQuat** (this Transform transform, Quaternion rotation)  
Transforms position from world space to local space, opposite of **TransformQuat()**.  
[More...](#)

static Vector2 **CenterToScreenPoint** (this RectTransform transform)  
Convert the center of a specified `UnityEngine.RectTransform` to screen space point.  
[More...](#)

static void **SetSorting** (this Component component, int order)  
Set the sorting order of the UI element inside a `UnityEngine.Canvas`. [More...](#)

## Detailed Description

**Extension** methods for `UnityEngine.Component`.

## Member Function Documentation

```
static string GetPath ( this Transform transform,
                        string separator = "/"
                        )
```

static

Get the hierarchy path, used for log or `GameObject.Find()` with the default separator.

### Returns

The hierarchy path.

### Parameters

**transform** Transform.

**separator** Separator.

```
static Quaternion TransformQuat ( this Transform transform,
                                Quaternion rotation
                                )
```

static

Transforms rotation from local space to world space.

#### Returns

The world rotation.

#### Parameters

**transform** Transform.

**rotation** Local rotation.

```
static Quaternion InverseTransformQuat ( this Transform transform,
                                          Quaternion rotation
                                          )
```

static

Transforms position from world space to local space, opposite of **TransformQuat()**.

#### Returns

The local rotation.

#### Parameters

**transform** Transform.

**rotation** World rotation.

```
static Vector2 CenterToScreenPoint ( this RectTransform transform )
```

static

Convert the center of a specified `UnityEngine.RectTransform` to screen space point.

#### Returns

The screen point.

#### Parameters

**transform** Transform.

```
static void SetSorting ( this Component component,  
                        int order  
                        )
```

static

Set the sorting order of the UI element inside a `UnityEngine.Canvas`.

This only apply the sub canvas in a root canvas. Check to add it with `UnityEngine.UI.GraphicRaycaster` if not existing.

### Parameters

**component** Component.

**order** Sorting order.

# TypeExtension

[Released Packages](#) » [3P MakerReleased Packages](#) » |

[ClipboardReleased Packages](#) » | [Editor AiderReleased Packages](#)

» | [Event DelegatorSpecific Classes](#) » |

[ExtensionsReleased Packages](#) » | [NotebookReleased Packages](#)

» | [ShortcutReleased Packages](#) » | [Www Loader](#)

**Extension** methods for `System.Type`. [More...](#)

## Static Public Member Functions

static string **GetPrettyName** (this Type type, bool full=false)

Get a pretty readable name of the type, even generic, optional to use the full name.

[More...](#)

static Type **GetNestedType** (this Type type, string name, bool isStatic)

Get the named public or nonpublic nested type of the specified type. [More...](#)

static FieldInfo **GetField** (this Type type, string name, bool isStatic, Type fieldType=null)

Get the named public or nonpublic `FieldInfo` of the specified type. [More...](#)

static PropertyInfo **GetProperty** (this Type type, string name, bool isStatic, Type propertyType=null, params Type[] indexTypes)

Get the named public or nonpublic `PropertyInfo` of the specified type. [More...](#)

static MethodInfo **GetMethod** (this Type type, string name, bool isStatic, Type returnType=null, params Type[] paramTypes)

Get the named public or nonpublic `MethodInfo` of the specified type. [More...](#)

static Type[] **GetParents** (this Type type)

Get the parent hierarchy array, sorted from self to root type. [More...](#)

static Type[] **GetChildren** (this Type type, bool deep=false)

Get all child types, excluding self, optional to find deep or directly inheritance only.

[More...](#)

static Type **GetItemType** (this Type type)

Return the element type of an array or list type, otherwise `null`. [More...](#)

static object **GetDefault** (this Type type)

Get the default value of the type, just like `default(T)`. [More...](#)

static bool **IsCreatable** (this Type type, bool exception=false)

Determine if able to create an instance of the type. [More...](#)

## Detailed Description

**Extension** methods for `System.Type`.



## Member Function Documentation

---

```
static string GetPrettyName ( this Type type,  
                             bool      full = false  
                             )
```

static

Get a pretty readable name of the type, even generic, optional to use the full name.

This doesn't handle anonymous types.

### Returns

The pretty name.

### Parameters

**type** Type.

**full** If set to `true` use the full name.

```
static Type GetNestedType ( this Type type,  
                            string   name,  
                            bool     isStatic  
                            )
```

static

Get the named public or nonpublic nested type of the specified type.

### Returns

The nested type.

### Parameters

**type** Type.

**name** Type name.

**isStatic** If to get a static type.

```
static FieldInfo GetField ( this Type type,
                           string name,
                           bool isStatic,
                           Type fieldType = null
                           )
```

static

Get the named public or nonpublic `FieldInfo` of the specified type.

### Returns

The field.

### Parameters

**type** Type.

**name** Field name.

**isStatic** If to get a static field.

**fieldType** Field type.

```
static PropertyInfo GetProperty ( this Type type,
                                   string name,
                                   bool isStatic,
                                   Type propertyType = null,
                                   params Type[] indexTypes
                                   )
```

static

Get the named public or nonpublic `PropertyInfo` of the specified type.

### Returns

The property.

### Parameters

**type** Type.

**name** Property name.

**isStatic** If to get a static property.

**propertyType** Property type.

**indexTypes** Index types.

```
static MethodInfo GetMethod ( this Type    type,  
                             string      name,  
                             bool        isStatic,  
                             Type        returnType = null,  
                             params Type[] paramTypes  
                             )
```

static

Get the named public or nonpublic `MethodInfo` of the specified type.

### Returns

The method.

### Parameters

**type** Type.

**name** Method name.

**isStatic** If to get a static method.

**returnType** Return type.

**paramTypes** Parameter types.

```
static Type [] GetParents ( this Type type )
```

static

Get the parent hierarchy array, sorted from self to root type.

### Returns

The parent hierarchy array.

### Parameters

**type** Type.

```
static Type [] GetChildren ( this Type type,
                             bool    deep = false
                             )
```

static

Get all child types, excluding self, optional to find deep or directly inheritance only.

#### Returns

The child types.

#### Parameters

**type** Type.

**deep** If set to `true` deep.

```
static Type GetItemType ( this Type type )
```

static

Return the element type of an array or list type, otherwise `null`.

#### Returns

The element type.

#### Parameters

**type** Type.

```
static object GetDefault ( this Type type )
```

static

Get the default value of the type, just like `default(T)`.

#### Returns

The default value.

#### Parameters

**type** Type.

```
static bool IsCreatable ( this Type type,  
                          bool      exception = false  
                          )
```

static

Determine if able to create an instance of the type.

Optional to throw an exception message or just return `false` if invalid. This only checks some basic conditions and might be not precise.

The current conditions below:

1. Return `false` only if it's interface, abstract, generic definition, delegate.
2. Recurse to check the element type of an array type.
3. Recurse to check the generic arguments of a list or dictionary type.

### Returns

`true`, if creatable, `false` otherwise.

### Parameters

**type**      Type.

**exception** Flag to throw an exception or return `false`.