SaintsField

Unity 2019.1+ License MIT openupm v1.2.1 downloads 18/month

SaintsField is a Unity Inspector extension tool focusing on script fields like NaughtyAttributes but different.

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Unity: 2019.1 or higher

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1. Highlights

- 1. Works on deep nested fields!
- 2. Use and only use PropertyDrawer and DecoratorDrawer, thus it will be compatible with most Unity Inspector enhancements like NaughtyAttributes and your custom drawer.
- 3. Allow stack on many cases. Only attributes that modified the label itself, and the field itself can not be stacked. All other attributes can mostly be stacked.
- 4. Allow dynamic arguments in many cases

2. Installation

Using OpenUPM

```
openupm add today.comes.saintsfield
```

• Using git upm:

add to Packages/manifest.json in your project

```
{
   "dependencies": {
      "today.comes.saintsfield": "https://github.com/TylerTemp/SaintsField.git",
      // your other dependencies...
}
}
```

Using a unitypackage :

Go to the Release Page to download a desired version of unitypackage and import it to your project

• Using a git submodule:

```
git submodule add https://github.com/TylerTemp/SaintsField.git Assets/SaintsField
```

If you're using unitypackage or git submodule but you put this project under another folder rather than Assets/SaintsField , please also do the following:

- Create Assets/Editor Default Resources/SaintsField .
- Copy only image files (no .meta files) from project's Editor/Editor Default

 Resources/SaintsField into your project's Assets/Editor Default Resources/SaintsField .
- (No longer needed:) Select all the image files you copied, and enable the option for these icons.

3. Change Log

1.2.2

- 1. No longer need read/write enabled when using a picture as icon
- 2. AboveImage / BelowImage now will try to get the image from the field when no name is given
- 3. Change how the scale of AssetPreview handled

4. Document

4.1. Label & Text

4.1.1. RichLabel

- string | null richTextXml the content of the label, supported tag:
 - All Unity rich label tag, like <color=#ff0000>red</color>
 - <label /> for current field name
 - < <icon=path/to/image.png /> for icon

null means no label

for icon it will search the following path (This will always fallback to built-in editor resources by name, as it uses EditorGUIUtility.Load):

- "Assets/Editor Default Resources/" (You can override things here, or put your own icons),
- "Assets/Editor Default Resources/SaintsField/" (again for override)
- "Assets/SaintsField/Editor/Editor Default Resources/SaintsField/" (this is most likely to be when installed using unitypackage)
- "Packages/today.comes.saintsfield/Editor/Editor Default Resources/SaintsField/" (this is most likely to be when installed using upm)

for color it supports:

Standard Unity Rich Label colors:

```
aqua , black , blue , brown , cyan , darkblue , fuchsia , green , gray , grey , lightblue , lime , magenta , maroon , navy , olive , orange , purple , red , silver , teal , white , yellow
```

Some extra colors from NaughtyAttributes :

```
clear , pink , indigo , violet
```

o html color which is supported by ColorUtility.TryParseHtmlString , like #RRGGBB , #RRGGBBAA , #RGB , #RGBA



bool isCallback=false

if true, the richTextXml will be interpreted as a property/callback function, and the string value / the returned string value (tag supported) will be used as the label content

• AllowMultiple: No. A field can only have one RichLabel

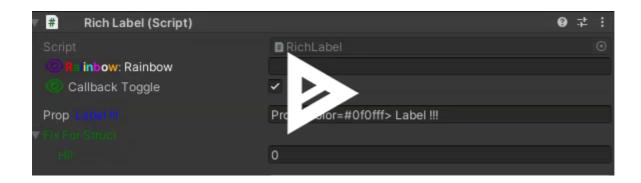
Special Note:

Use it on an array/list will apply it to all the direct child element instead of the field label itself. You can use this to modify elements of an array/list field, in this way:

- 1. Ensure you make it a callback: isCallback=true
- 2. Your function must receive one int argument
- 3. The int argument will receive a value from 0 to length-1 of the array/list
- 4. Return the desired label content from the function

```
[RichLabel("<color=green>HI!</color>")]
    public float LabelFloat;
}

[SerializeField]
[RichLabel("<color=green>Fixed For Struct!</color>")]
    private MyStruct _myStructWorkAround;
}
```



Here is an example of using on a array:

```
[RichLabel(nameof(ArrayLabels), true)]
public string[] arrayLabels;

private string ArrayLabels(int index) => $"<color=pink>[{(char)('A' + index)}]";

ArrayLabels

[A]
[B]
[C]
[D]
```

4.1.2. AboveRichLabel / BelowRichLabel

Like RichLabel , but it's rendered above/below the field in full width of view instead.

- string | null richTextXml Same as RichLabel
- bool isCallback=false Same as RichLabel
- string groupBy = "" See GroupBy section
- AllowMultiple: Yes

```
public class FullWidthRichLabelExample: MonoBehaviour
{
     [SerializeField]
     [AboveRichLabel("r<icon=eye.png/><label />¬")]
     [RichLabel("r<icon=eye.png/><label />¬")]
     [BelowRichLabel(nameof(BelowLabel), true)]
```

4.1.3. OverlayRichLabel

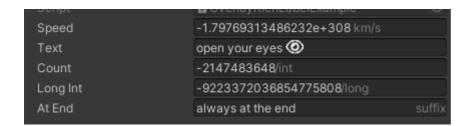
Like RichLabel , but it's rendered on top of the field.

Only supports string/number type of field. Does not work with any kind of TextArea (multiple line) and Range .

Parameters:

- string richTextXml the content of the label, or a property/callback. Supports tags like
 RichLabel
- bool isCallback=false if true, the richTextXml will be interpreted as a property/callback function, and the string value / the returned string value (tag supported) will be used as the label content
- float padding=5f padding between your input and the label. Not work when end=true
- bool end=false when false, the label will follow the end of your input. Otherwise, it will stay at the end of the field.
- string GroupBy="" this is only for the error message box.
- AllowMultiple: No

```
public class OverlayRichLabelExample: MonoBehaviour
{
     [OverlayRichLabel("<color=grey>km/s")] public double speed = double.MinValue;
     [OverlayRichLabel("<icon=eye.png/>")] public string text;
     [OverlayRichLabel("<color=grey>/int", padding: 1)] public int count = int.MinValue;
     [OverlayRichLabel("<color=grey>/long", padding: 1)] public long longInt = long.MinValue;
     [OverlayRichLabel("<color=grey>suffix", end: true)] public string atEnd;
}
```



4.1.4. PostFieldRichLabel

Like RichLabel , but it's rendered at the end of the field.

Parameters:

- string richTextXml the content of the label, or a property/callback. Supports tags like RichLabel
- bool isCallback=false if true, the richTextXml will be interpreted as a property/callback function, and the string value / the returned string value (tag supported) will be used as the label content
- float padding=5f padding between the field and the label.
- string GroupBy="" this is only for the error message box.
- AllowMultiple: Yes

```
public class PostFieldRichLabelExample: MonoBehaviour
{
    [PostFieldRichLabel("<color=grey>km/s")] public float speed;
    [PostFieldRichLabel("<icon=eye.png/>", padding: 0)] public GameObject eye;
    [PostFieldRichLabel(nameof(TakeAGuess), isCallback: true)] public int guess;
    public string TakeAGuess()
   {
        if(guess > 20)
            return "<color=red>too high";
        }
        if (guess < 10)
            return "<color=blue>too low";
        }
        return "<color=green>acceptable!";
   }
}
```

4.1.5. InfoBox

Draw an info box above/below the field.

string content

The content of the info box

• EMessageType messageType=EMessageType.Info

Message icon. Options are

- None
- o Info
- O Warning
- O Error
- string show=null

a callback name or property name for show or hide this info box.

bool contentIsCallback=false

if true, the content will be interpreted as a property/callback function.

If the value (or returned value) is a string, then the content will be changed

If the value is (string content, EMessageType messageType) then both content and message type will be changed

bool above=false

Draw the info box above the field instead of below

- string groupBy="" See GroupBy section
- AllowMultiple: Yes

```
public class InfoBoxExample : MonoBehaviour
{
    [field: SerializeField] private bool _show;

    [Space]
    [InfoBox("Hi\nwrap long line content content content content content content [InfoBox(nameof(DynamicMessage), EMessageType.Warning, contentIsCallback: true, above: true    [InfoBox(nameof(DynamicMessageWithIcon), contentIsCallback: true)]
    [InfoBox("Hi\n toggle content ", EMessageType.Info, nameof(_show))]
    public bool _content;

    private (EMessageType, string) DynamicMessageWithIcon => _content ? (EMessageType.Error, "
```

```
private string DynamicMessage() => _content ? "False" : "True";
}
```

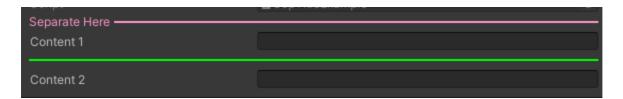
4.1.6. SepTitle

A separator with text

- string title=null title, null for no title at all. Does NOT support rich text
- EColor color , color for title and line separator
- float gap = 2f , space between title and line separator
- float height = 2f , height of this decorator

```
public class SepTitleExample: MonoBehaviour
{
    [SepTitle("Separate Here", EColor.Pink)]
    public string content1;

    [SepTitle(EColor.Green)]
    public string content2;
}
```



4.2. General Buttons

There are 3 general buttons:

- AboveButton will draw a button on above
- BelowButton will draw a button on below
- PostFieldButton will draw a button at the end of the field

All of them have the same arguments:

string funcName
 called when you click the button

string buttonLabel

label of the button, support tags like RichLabel

bool buttonLabelIsCallback = false

a callback or property name for button's label, same as RichLabel

• string groupBy = ""

See GroupBy section. Does **NOT** work on PostFieldButton

• AllowMultiple: Yes

```
public class ButtonsExample : MonoBehaviour
{
    [SerializeField] private bool _errorOut;
    [field: SerializeField] private string _labelByField;
    [AboveButton(nameof(ClickErrorButton), nameof(_labelByField), true)]
    [AboveButton(nameof(ClickErrorButton), "Click <color=green><icon='eye.png' /></color>!")]
    [AboveButton(nameof(ClickButton), nameof(GetButtonLabel), true, "OK")]
    [AboveButton(nameof(ClickButton), nameof(GetButtonLabel), true, "OK")]
    [PostFieldButton(nameof(ToggleAndError), nameof(GetButtonLabelIcon), true)]
    [BelowButton(nameof(ClickButton), nameof(GetButtonLabel), true, "OK")]
    [BelowButton(nameof(ClickButton), nameof(GetButtonLabel), true, "OK")]
    [BelowButton(nameof(ClickErrorButton), "Below <color=green><icon='eye.png' /></color>!")]
    public int _someInt;
    private void ClickErrorButton() => Debug.Log("CLICKED!");
   private string GetButtonLabel() =>
        errorOut
            ? "Error <color=red>me</color>!"
            : "No <color=green>Error</color>!";
    private string GetButtonLabelIcon() => _errorOut
        ? "<color=red><icon='eye.png' /></color>"
        : "<color=green><icon='eye.png' /></color>";
    private void ClickButton()
       Debug.Log("CLICKED 2!");
        if(_errorOut)
            throw new Exception("Expected exception!");
        }
    }
    private void ToggleAndError()
        Toggle();
        ClickButton();
```

```
private void Toggle() => _errorOut = !_errorOut;
}
```

4.3. Field Modifier

4.3.1. GameObjectActive

A toggle button to toggle the GameObject.activeSelf of the field.

This does not require the field to be GameObject. It can be a component which already attached to a GameObject.

• AllowMultiple: No

```
public class GameObjectActiveExample : MonoBehaviour
{
    [GameObjectActive] public GameObject _go;
    [GameObjectActive] public GameObjectActiveExample _component;
}
```



4.3.2. SpriteToggle

A toggle button to toggle the Sprite of the target.

The field itself must be Sprite .

- string imageOrSpriteRenderer
 - the target, must be either <code>UI.Image</code> Or <code>SpriteRenderer</code>
- AllowMultiple: Yes

```
public class SpriteToggleExample : MonoBehaviour
{
    [field: SerializeField] private Image _image;
    [field: SerializeField] private SpriteRenderer _sprite;
```

```
[SerializeField
   , SpriteToggle(nameof(_image))
   , SpriteToggle(nameof(_sprite))
] private Sprite _sprite1;
[SerializeField
   , SpriteToggle(nameof(_image))
   , SpriteToggle(nameof(_sprite))
] private Sprite _sprite2;
}
```

4.3.3. MaterialToggle

A toggle button to toggle the Material of the target.

The field itself must be Material .

• string rendererName=null

the target, must be Renderer (or its subClass like MeshRenderer). When using null, it will try to get the Renderer component from the current component

• int index=0

which slot index of materials on Renderer you want to swap

AllowMultiple: Yes

```
public class MaterialToggleExample: MonoBehaviour
{
    public Renderer targetRenderer;
    [MaterialToggle(nameof(targetRenderer))] public Material _mat1;
    [MaterialToggle(nameof(targetRenderer))] public Material _mat2;
}
```



4.3.4. ColorToggle

A toggle button to toggle color for Image , Button , SpriteRenderer Or Renderer

The field itself must be Material .

string compName=null

```
the target, must be Image , Button , SpriteRenderer , or Renderer (or its subClass like MeshRenderer ).
```

When using <code>null</code> , it will try to get the correct component from the target object of this field by order.

When it's a Renderer , it will change the material's .color property.

When it's a Button , it will change the button's targetGraphic.color property.

• int index=0

(only works for Renderer type) which slot index of materials on Renderer you want to apply the color

AllowMultiple: Yes

```
public class ColorToggleImage: MonoBehaviour
{
    // auto find on the target object
```

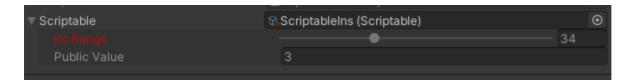
```
[SerializeField, ColorToggle] private Color _onColor;
[SerializeField, ColorToggle] private Color _offColor;
[Space]
   // by name
   [SerializeField] private Image _image;
   [SerializeField, ColorToggle(nameof(_image))] private Color _onColor2;
   [SerializeField, ColorToggle(nameof(_image))] private Color _offColor2;
}
```

4.3.5. Expandable

Make serializable object expandable. (E.g. ScriptableObject , MonoBehavior)

• AllowMultiple: No

```
public class ExpandableExample : MonoBehaviour
{
    [Expandable] public ScriptableObject _scriptable;
}
```



4.4. Field Re-Draw

This will change the look & behavior of a field.

4.4.1. Rate

A rating stars tool for an int field.

Parameters:

• int min minimum value of the rating. Must be equal to or greater than 0.

When it's equal to 0, it'll draw a red slashed star to select 0.

When it's greater than 0, it will draw min number of fixed stars that you can not un-rate.

- int max maximum value of the rating. Must be greater than min .
- AllowMultiple: No

```
public class RateExample: MonoBehaviour
{
     [Rate(0, 5)] public int rate0To5;
     [Rate(1, 5)] public int rate1To5;
     [Rate(3, 5)] public int rate3To5;
}
```

```
Rate 0 To 5
Rate 1 To 5
Rate 3 To 5
```

4.4.2. FieldType

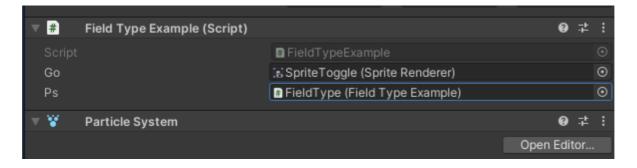
Ask the inspector to display another type of field rather than the field's original type.

This is useful when you want to have a <code>GameObject</code> prefab, but you want this target prefab to have a specific component (e.g. your own <code>MonoScript</code> , or a <code>ParticalSystem</code>). By using this you force the inspector to sign the required object that has your expected component but still gives you the original typed value to field.

AllowMultiple: No

```
public class FieldTypeExample: MonoBehaviour
{
     [SerializeField, FieldType(typeof(SpriteRenderer))]
     private GameObject _go;

     [SerializeField, FieldType(typeof(FieldTypeExample))]
     private ParticleSystem _ps;
}
```



4.4.3. Dropdown

A dropdown selector. Supports reference type, sub-menu, separator, and disabled select item.

- string funcName callback function. Must return a DropdownList<T> .
- AllowMultiple: No

```
public class DropdownExample : MonoBehaviour
{
    [Dropdown(nameof(GetDropdownItems))] public float _float;
    public GameObject _go1;
    public GameObject _go2;
    [Dropdown(nameof(GetDropdownRefs))] public GameObject _refs;
    private DropdownList<float> GetDropdownItems()
        return new DropdownList<float>
        {
            { "1", 1.0f },
            { "2", 2.0f },
            { "3/1", 3.1f },
            { "3/2", 3.2f },
        };
    }
    private DropdownList<GameObject> GetDropdownRefs => new DropdownList<GameObject>
    {
        {_go1.name, _go1},
        {_go2.name, _go2},
        {"NULL", null},
    };
}
```

To control the separator and disabled item

```
[Dropdown(nameof(GetDropdownItems))]
public Color color;
private DropdownList<Color> GetDropdownItems()
{
    return new DropdownList<Color>
        { "Black", Color.black },
        { "White", Color.white },
        DropdownList<Color>.Separator(),
        { "Basic/Red", Color.red, true }, // the third arg means it's disabled
        { "Basic/Green", Color.green },
        { "Basic/Blue", Color.blue },
        DropdownList<Color>.Separator("Basic/"),
        { "Basic/Magenta", Color.magenta },
        { "Basic/Cyan", Color.cyan },
    };
}
```

And you can always manually add it:

```
DropdownList<Color> dropdownList = new DropdownList<Color>();
dropdownList.Add("Black", Color.black); // add an item
dropdownList.Add("White", Color.white, true); // and a disabled item
dropdownList.AddSeparator(); // add a separator
```

To control the separator and disabled item

```
[Dropdown(nameof(GetDropdownItems))]
public Color color;
private DropdownList<Color> GetDropdownItems()
{
   return new DropdownList<Color>
    {
        { "Black", Color.black },
        { "White", Color.white },
        DropdownList<Color>.Separator(),
       { "Basic/Red", Color.red, true }, // the third arg means it's disabled
        { "Basic/Green", Color.green },
        { "Basic/Blue", Color.blue },
        DropdownList<Color>.Separator("Basic/"),
        { "Basic/Magenta", Color.magenta },
        { "Basic/Cyan", Color.cyan },
   };
}
```

And you can always manually add it:

```
DropdownList<Color> dropdownList = new DropdownList<Color>();
dropdownList.Add("Black", Color.black); // add an item
dropdownList.Add("White", Color.white, true); // and a disabled item
dropdownList.AddSeparator(); // add a separator
```

4.4.4. AdvancedDropdown

A dropdown selector using Unity's AdvancedDropdown . Supports reference type, sub-menu, separator, and disabled select item, plus icon.

Known Issue: Unity's AdvancedDropdown allows to click the disabled item and close the popup, thus you can still click the disable item. This is a BUG from Unity. I managed to "hack" it around to show again the popup when you click the disabled item, but you will see the flick of the popup. This issue is not fixable unless Unity fixes it.

- string funcName callback function. Must return a AdvancedDropdownList<T> .
- float itemHeight=-1f height of each item. < 0 means use Unity's default value. This will be used to decide the dropdown height.
- float titleHeight=Default height of the title. This will be used to decide the dropdown height.
- float sepHeight=Default height of separator. This will be used to decide the dropdown height.
- bool useTotalItemCount=false if true, the dropdown height will be decided using the number of all value item, thus the search result will always fit in the position without scroll. Otherwise, it'll be decided by the max height of every item page.
- float minHeight=-1f minimum height of the dropdown. < 0 means no limit. Otherwise, use this as the dropdown height and ignore all the other auto height config.
- AllowMultiple: No

AdvancedDropdownList<T>

- string displayName item name to display
- T value Or IEnumerable<AdvancedDropdownList<T>> children : value means it's a value item.

 Otherwise it's a group of items, which the values are specified by children
- bool disabled = false if item is disabled
- string icon = null the icon for the item.

Note: setting an icon for a parent group will result an weird issue on it's sub page's title and block the items. This is not fixable unless Unity decide to fix it.

bool isSeparator = false if item is a separator. You should not use this, but
 AdvancedDropdownList<T>.Separator() instead

```
public class AdvancedDropdownExample: MonoBehaviour
{
    [AdvancedDropdown(nameof(AdvDropdown)), BelowRichLabel(nameof(drops), true)] public int dr

    [CanBeNull]
    public AdvancedDropdownList<int> AdvDropdown()
    {
        return new AdvancedDropdownList<int>("Select One!", new List<AdvancedDropdownList<int>
        {
            // a grouped value
            new AdvancedDropdownList<int>("First half", new List<AdvancedDropdownList<int>>()
            {
                  // with icon
```

```
new AdvancedDropdownList<int>("Monday", 1, icon: "eye.png"),
                // no icon
                new AdvancedDropdownList<int>("Tuesday", 2),
            }),
            new AdvancedDropdownList<int>("Second half", new List<AdvancedDropdownList<int>>()
            {
                new AdvancedDropdownList<int>("Wednesday", 3),
                new AdvancedDropdownList<int>("Thursday", 4, icon: "eye.png"),
            }),
            // direct value
            new AdvancedDropdownList<int>("Friday", 5, true), // disabled
            AdvancedDropdownList<int>.Separator(),
            new AdvancedDropdownList<int>("Saturday", 6, icon: "eye.png"),
            new AdvancedDropdownList<int>("Sunday", 7, icon: "eye.png"),
        });
   }
}
```

4.4.5. PropRange

Very like Unity's Range but allow you to dynamically change the range, plus allow to set range step.

For each argument:

- string minCallback or float min : the minimum value of the slider, or a property/callback name.
- string maxCallback or float max: the maximum value of the slider, or a property/callback

```
name.
```

• float step=-1f: the step for the range. <= 0 means no limit.

```
public class RangeExample: MonoBehaviour
{
    public int min;
    public int max;

    [PropRange(nameof(min), nameof(max))] public float rangeFloat;
    [PropRange(nameof(min), nameof(max))] public int rangeInt;

    [PropRange(nameof(min), nameof(max), step: 0.5f)] public float rangeFloatStep;
    [PropRange(nameof(min), nameof(max), step: 2)] public int rangeIntStep;
}
```

4.4.6. MinMaxSlider

A range slider for Vector2 or Vector2Int

For each argument:

- int|float min or string minCallback : the minimum value of the slider, or a property/callback name.
- int|float max Or string maxCallback : the maximum value of the slider, or a property/callback name.
- int|float step=1|-1f : the step of the slider, <= 0 means no limit. By default, int type use 1 and float type use -1f
- float minWidth=50f : the minimum width of the value label. < 0 for auto size (not recommended)
- float maxWidth=50f : the maximum width of the value label. < 0 for auto size (not recommended)
- AllowMultiple: No

a full-featured example:

```
public class MinMaxSliderExample: MonoBehaviour
{
    [MinMaxSlider(-1f, 3f, 0.3f)]
    public Vector2 vector2Step03;
    [MinMaxSlider(0, 20, 3)]
    public Vector2Int vector2IntStep3;
    [MinMaxSlider(-1f, 3f)]
    public Vector2 vector2Free;
    [MinMaxSlider(0, 20)]
    public Vector2Int vector2IntFree;
    // not recommended
    [SerializeField]
    [MinMaxSlider(0, 100, minWidth:-1, maxWidth:-1)]
    private Vector2Int _autoWidth;
    [field: SerializeField, MinMaxSlider(-100f, 100f)]
    public Vector2 OuterRange { get; private set; }
    [SerializeField, MinMaxSlider(nameof(GetOuterMin), nameof(GetOuterMax), 1)] public Vector2
   private float GetOuterMin() => OuterRange.x;
    private float GetOuterMax() => OuterRange.y;
    [field: SerializeField]
```

```
public float DynamicMin { get; private set; }
  [field: SerializeField]
  public float DynamicMax { get; private set; }

  [SerializeField, MinMaxSlider(nameof(DynamicMin), nameof(DynamicMax))] private Vector2 _pr
  [SerializeField, MinMaxSlider(nameof(DynamicMin), 100f)] private Vector2 _propLeftRange;
  [SerializeField, MinMaxSlider(-100f, nameof(DynamicMax))] private Vector2 _propRightRange;
}
```

4.4.7. EnumFlags

A toggle buttons group for enum flags (bit mask). It provides a button to toggle all bits on/off.

This field has compact mode and expanded mode.

For each argument:

- bool autoExpand=true : if the view is not enough to show all buttons in a row, automatically expand to a vertical group.
- bool defaultExpanded=false : if true, the buttons group will be expanded as a vertical group by default.
- AllowMultiple: No

Note: If you have a lot of flags and you turn **OFF** autoExpand , The buttons **WILL** go off-view.

```
public class EnumFlagsExample: MonoBehaviour
{
    [Serializable, Flags]
    public enum BitMask
    {
        None = 0, // this will be hide as we will have an all/none button
        Mask1 = 1,
        Mask2 = 1 << 1,
        Mask3 = 1 << 2,
    }
    [EnumFlags] public BitMask myMask;
}</pre>
```

4.4.8. ResizableTextArea

This TextArea will always grow its height to fit the content. (minimal height is 3 rows).

Note: Unlike NaughtyAttributes, this does not have a text-wrap issue.

AllowMultiple: No

```
public class ResizableTextAreaExample : MonoBehaviour
{
    [SerializeField, ResizableTextArea] private string _short;
    [SerializeField, ResizableTextArea] private string _long;
    [SerializeField, RichLabel(null), ResizableTextArea] private string _noLabel;
}
```

4.4.9. AnimatorParam

A dropdown selector for an animator parameter.

- string animatorName=null name of the animator. When omitted, it will try to get the animator from the current component
- (Optional) AnimatorControllerParameterType animatorParamType type of the parameter to filter

```
public class Anim : MonoBehaviour
{
    [field: SerializeField]
    public Animator Animator { get; private set;}

    [AnimatorParam(nameof(Animator))]
    private string animParamName;

    [AnimatorParam(nameof(Animator))]
    private int animParamHash;
}
```

4.4.10. AnimatorState

A dropdown selector for animator state.

string animatorName=null

name of the animator. When omitted, it will try to get the animator from the current component to get more useful info from the state, you can use AnimatorState type instead of string type.

AnimatorState has the following properties:

- int layerIndex index of layer
- int stateNameHash hash value of state
- string stateName actual state name
- float stateSpeed the Speed parameter of the state
- AnimationClip animationClip is the actual animation clip of the state (can be null). It has a length value for the length of the clip. For more detail see Unity Doc of AnimationClip

```
public class Anim : MonoBehaviour
{
    [field: SerializeField]
    public Animator Animator { get; private set; }

    [AnimatorState(nameof(Animator))]
    public AnimatorState animatorState;

    [AnimatorState(nameof(Animator))]
    public string animStateName;
}
```

4.4.11. Layer

A dropdown selector for layer.

AllowMultiple: No

Note: want a bitmask layer selector? Unity already has it. Just use public LayerMask myLayerMask;

```
public class LayerAttributeExample: MonoBehaviour
{
    [Layer] public string layerString;
    [Layer] public int layerInt;
}
```

4.4.12. Scene

A dropdown selector for a scene in the build list.

AllowMultiple: No

```
public class SceneExample: MonoBehaviour
{
    [Scene] public int _sceneInt;
```

```
[Scene] public string _sceneString;
}
```

4.4.13. SortingLayer

A dropdown selector for sorting layer.

• AllowMultiple: No

```
public class SortingLayerExample: MonoBehaviour
{
    [SortingLayer] public string _sortingLayerString;
    [SortingLayer] public int _sortingLayerInt;
}
```

4.4.14. Tag

A dropdown selector for a tag.

• AllowMultiple: No

```
public class TagExample: MonoBehaviour
{
    [Tag] public string _tag;
}
```

4.4.15. InputAxis

A string dropdown selector for an input axis.

AllowMultiple: No

```
public class InputAxisExample: MonoBehaviour
{
    [InputAxis] public string inputAxis;
}
```

4.4.16. LeftToggle

A toggle button on the left of the bool field. Only works on boolean field.

4.4.17. CurveRange

A curve drawer for AnimationCurve which allow to set bounds and color

Override 1:

- Vector2 min = Vector2.zero bottom left for bounds
- Vector2 max = Vector2.one top right for bounds
- EColor color = EColor.Green curve line color

Override 2:

- float minX = 0f bottom left x for bounds
- float minY = 0f bottom left y for bounds
- float maxX = 1f top right x for bounds
- float maxY = 1f top right y for bounds
- EColor color = EColor.Green curve line color

```
public class CurveRangeExample: MonoBehaviour
{
    [CurveRange(-1, -1, 1, 1)]
    public AnimationCurve curve;

    [CurveRange(EColor.Orange)]
    public AnimationCurve curve1;

    [CurveRange(0, 0, 5, 5, EColor.Red)]
    public AnimationCurve curve2;
}
```

4.5. Field Utilities

4.5.1. AssetPreview

Show an image preview for prefabs, Sprite, Texture2D, etc. (Internally use AssetPreview.GetAssetPreview)

Note: Sometimes AssetPreview.GetAssetPreview simply does not return a correct preview image or returns an empty image. When no image returns, nothing is shown. If an empty image returns, an empty rect is shown. This can not be fixed unless Unity decides to fix it.

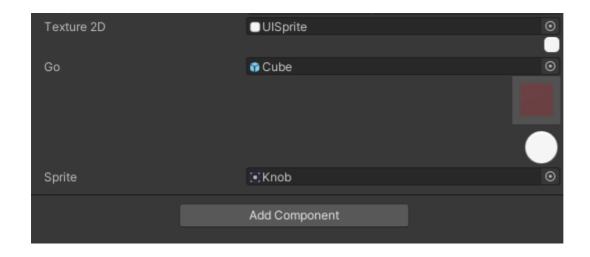
Note: Recommended to use AboveImage / BelowImage for image/sprite/texture2D.

- int maxWidth=-1

 preview max-width, -1 for original image size that returned by Unity. If it's greater than current view width, it'll be scaled down to fit the view. Use int.MaxValue to always fit the view width.
- int maxHeight=-1
 preview max height, -1 for auto resize (with the same aspect) using the width
- EAlign align=EAlign.End

 Align of the preview image. Options are Start , End , Center , FieldStart
- bool above=false
 if true, render above the field instead of below
- string groupBy=""See the GroupBy section
- AllowMultiple: No

```
public class AssetPreviewExample: MonoBehaviour
{
    [AssetPreview(20, 100)] public Texture2D _texture2D;
    [AssetPreview(50)] public GameObject _go;
    [AssetPreview(above: true)] public Sprite _sprite;
}
```



4.5.2. AboveImage / BelowImage

Show an image above/below the field.

• string image = null

An image to display. This can be a property or a callback, which returns a Sprite , Texture2D , SpriteRenderer , UI.Image , UI.RawImage Or UI.Button .

If it's null, it'll try to get the image from the field itself.

• string maxWidth=-1

preview max width, -1 for original image size. If it's greater than current view width, it'll be scaled down to fit the view. . Use int.MaxValue to always fit the view width.

• int maxHeight=-1

preview max height, -1 for auto resize (with the same aspect) using the width

• EAlign align=EAlign.Start

Align of the preview image. Options are Start , End , Center , FieldStart

string groupBy=""

See the GroupBy section

AllowMultiple: No

```
public class ShowImageExample: MonoBehaviour
{
     [AboveImage(nameof(spriteField))]
     // size and group
     [BelowImage(nameof(spriteField), maxWidth: 25, groupBy: "Below1")]
     [BelowImage(nameof(spriteField), maxHeight: 20, align: EAlign.End, groupBy: "Below1")]
     public Sprite spriteField;
```

```
// align
[BelowImage(nameof(spriteField), maxWidth: 20, align: EAlign.FieldStart)]
[BelowImage(nameof(spriteField), maxWidth: 20, align: EAlign.Start)]
[BelowImage(nameof(spriteField), maxWidth: 20, align: EAlign.Center)]
[BelowImage(nameof(spriteField), maxWidth: 20, align: EAlign.End)]
public string alignField;
}
```

4.5.3. OnValueChanged

Call a function every time the field value is changed

- string callback the callback function name
- AllowMultiple: Yes

```
public class OnChangedExample : MonoBehaviour
{
    [OnValueChanged(nameof(Changed))]
    public int _value;

    private void Changed()
    {
        Debug.Log($"changed={_value}");
    }
}
```

4.5.4. ReadOnly

This has two overrides:

- ReadOnlyAttribute(bool directValue)
- ReadOnlyAttribute(params string[] by)

Each arguments:

bool directValue=false

if true, the field will be read-only

string[] by

a callback or property name, if ALL the value is truly, the field will be read-only

AllowMultiple: Yes

When using multiple ReadOnly on a field, the field will be read only if ANY of them is read-only

```
public class ReadOnlyGroupExample: MonoBehaviour
{
    [ReadOnly(true)] public string directlyReadOnly;
    [SerializeField] private bool _bool1;
    [SerializeField] private bool _bool2;
    [SerializeField] private bool _bool3;
    [SerializeField] private bool _bool4;
    [SerializeField]
    [ReadOnly(nameof(_bool1))]
    [ReadOnly(nameof(_bool2))]
    [RichLabel("readonly=1||2")]
    private string _ro1and2;
    [SerializeField]
    [ReadOnly(nameof(_bool1), nameof(_bool2))]
    [RichLabel("readonly=1&&2")]
    private string _ro1or2;
    [SerializeField]
    [ReadOnly(nameof(_bool1), nameof(_bool2))]
    [ReadOnly(nameof(_bool3), nameof(_bool4))]
    [RichLabel("readonly=(1&&2)||(3&&4)")]
   private string _ro1234;
}
```

4.5.5. Required

Remide a given reference type field to be required.

This will check if the field value is a truly value, which means:

- 1. Won't work for int and float (It'll give an error, asking you to not use on int/float)
- 2. The struct value will always be truly because struct is not nullable and Unity will fill a default value for it no matter what
- 3. It works on reference type and will NOT skip Unity's life-circle null check
- string errorMessage = null Error message. Default is {label} is required
- AllowMultiple: No

```
public class RequiredExample: MonoBehaviour
{
    [Required("Add this please!")] public Sprite _spriteImage;
    // works for the property field
```

```
[field: SerializeField, Required] public GameObject Go { get; private set; }
[Required] public UnityEngine.Object _object;
[SerializeField, Required] private float _wontWork;

[Serializable]
public struct MyStruct
{
    public int theInt;
}

[Required]
public MyStruct wontWorkWontNoticeYou;
}
```

4.5.6. ValidateInput

Validate the input of the field when the value changes.

- string callback is the callback function to validate the data. note: return type is **string** not bool! return a null or empty string for valid, otherwise, the string will be used as the error message
- AllowMultiple: Yes

```
public class ValidateInputExample : MonoBehaviour
{
     [ValidateInput(nameof(OnValidateInput))]
     public int _value;

     private string OnValidateInput() => _value < 0 ? $"Should be positive, but gets {_value}"
}</pre>
```

4.5.7. ShowIf / HideIf

Show or hide the field based on a condition.

For ShowIf :

- string andCallbacks... a list of callback or property names, if **ALL** the value is truly, the field will be shown/hidden
- AllowMultiple: Yes

When using multiple ShowIf on a field, the field will be shown if ANY of them is shown

HideIf is the opposite of ShowIf . You can use multiple ShowIf , HideIf , and even a mix of the two

A full featured example:

```
public class ShowHideExample: MonoBehaviour
{
    public bool _bool1;
    public bool _bool2;
    public bool _bool3;
    public bool _bool4;
    [ShowIf(nameof(_bool1))]
    [ShowIf(nameof(_bool2))]
    [RichLabel("<color=red>show=1||2")]
    public string _showIf10r2;
    [ShowIf(nameof(_bool1), nameof(_bool2))]
    [RichLabel("<color=green>show=1&&2")]
    public string _showIf1And2;
    [HideIf(nameof(_bool1))]
    [HideIf(nameof(_bool2))]
    [RichLabel("<color=blue>show=!1||!2")]
    public string _hideIf10r2;
    [HideIf(nameof(_bool1), nameof(_bool2))]
    [RichLabel("<color=yellow>show=!1&&!2")]
    public string _hideIf1And2;
    [ShowIf(nameof(_bool1))]
    [HideIf(nameof(_bool2))]
    [RichLabel("<color=magenta>show=1||!2")]
    public string _showIf10rNot2;
    [ShowIf(nameof(_bool1), nameof(_bool2))]
    [ShowIf(nameof(_bool3), nameof(_bool4))]
    [RichLabel("<color=orange>show=(1&&2)||(3&&4)")]
    public string _showIf1234;
    [HideIf(nameof(_bool1), nameof(_bool2))]
    [HideIf(nameof(_bool3), nameof(_bool4))]
    [RichLabel("<color=pink>show=(!1&&!2)||(!3&&!4)")]
    public string _hideIf1234;
}
```

Limit for int/float field

They have the same overrides:

- float value : directly limit to a number value
- string valueCallback : a callback or property for limit
- AllowMultiple: Yes

```
public class MinMaxExample: MonoBehaviour
{
    public int upLimit;

    [MinValue(0), MaxValue(nameof(upLimit))] public int min0Max;
    [MinValue(nameof(upLimit)), MaxValue(10)] public float fMinMax10;
}
```



4.5.9. GetComponent

Automatically sign a component to a field, if the field value is null and the component is already attached to current target. (First one found will be used)

Type compType = null

The component type to sign. If null, it'll use the field type.

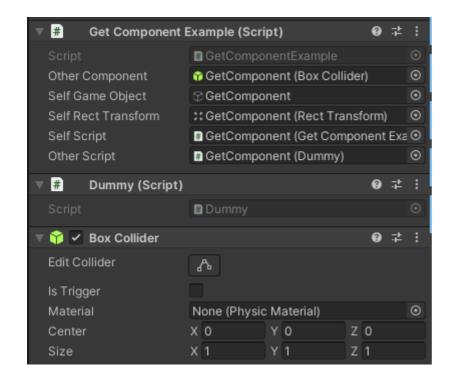
string groupBy = ""

For error message grouping.

• AllowMultiple: No

```
public class GetComponentExample: MonoBehaviour
{
    [GetComponent] public BoxCollider otherComponent;
    [GetComponent] public GameObject selfGameObject; // get the GameObject itself
    [GetComponent] public RectTransform selfRectTransform; // useful for UI

    [GetComponent] public GetComponentExample selfScript; // yeah you can get your script its
    [GetComponent] public Dummy otherScript; // other script
}
```



4.5.10. GetComponentInChildren

Automatically sign a component to a field, if the field value is null and the component is already attached to its child GameObjects. (First one found will be used)

NOTE: Unlike GetComponentInChildren by Unity, this will **NOT** check the target object itself.

• bool includeInactive = false

Should inactive children be included? true to include inactive children.

• Type compType = null

The component type to sign. If null, it'll use the field type.

string groupBy = ""

For error message grouping.

AllowMultiple: No

```
public class GetComponentInChildrenExample: MonoBehaviour
{
    [GetComponentInChildren] public BoxCollider childBoxCollider;
    // by setting compType, you can sign it as a different type
    [GetComponentInChildren(compType: typeof(Dummy))] public BoxCollider childAnotherType;
    // and GameObject field works too
    [GetComponentInChildren(compType: typeof(BoxCollider))] public GameObject childBoxCollider
}
```

4.5.11. GetComponentInScene

Automatically sign a component to a field, if the field value is null and the component is in the currently opened scene. (First one found will be used)

bool includeInactive = false
 Should inactive GameObject be included? true to include inactive GameObject.

• Type compType = null

The component type to sign. If null, it'll use the field type.

string groupBy = ""For error message grouping.

• AllowMultiple: No

```
public class GetComponentInSceneExample: MonoBehaviour
{
    [GetComponentInScene] public Dummy dummy;
    // by setting compType, you can sign it as a different type
    [GetComponentInScene(compType: typeof(Dummy))] public RectTransform dummyTrans;
    // and GameObject field works too
    [GetComponentInScene(compType: typeof(Dummy))] public GameObject dummyGo;
}
```

4.5.12. GetPrefabWithComponent

Automatically sign a prefab to a field, if the field value is null and the prefab has the component. (First one found will be used)

Recommended to use it with FieldType!

Type compType = null

The component type to sign. If null, it'll use the field type.

string groupBy = ""

For error message grouping.

• AllowMultiple: No

```
public class GetPrefabWithComponentExample: MonoBehaviour
{
```

```
[GetPrefabWithComponent] public Dummy dummy;
// get the prefab itself
[GetPrefabWithComponent(compType: typeof(Dummy))] public GameObject dummyPrefab;
// works so good with `FieldType`
[GetPrefabWithComponent(compType: typeof(Dummy)), FieldType(typeof(Dummy))] public GameObj
}
```

4.5.13. GetScriptableObject

Automatically sign a ScriptableObject file to this field. (First one found will be used)

Recommended to use it with Expandable!

- string pathSuffix=null the path suffix for this ScriptableObject . null for no limit. for example: if it's /Resources/mySo , it will only sign the file whose path is ends with /Resources/mySo.asset , like Assets/proj/Resources/mySo.asset
- AllowMultiple: No

```
public class GetScriptableObjectExample: MonoBehaviour
{
    [GetScriptableObject] public Scriptable mySo;
    [GetScriptableObject("RawResources/ScriptableIns")] public Scriptable mySoSuffix;
}
```

4.5.14. AddComponent

Automatically add a component to the current target if the target does not have this component. (This will not sign the component added)

Recommended to use it with GetComponent!

Type compType = null

The component type to add. If null, it'll use the field type.

string groupBy = ""

For error message grouping.

AllowMultiple: Yes

```
public class AddComponentExample: MonoBehaviour
{
```

```
[AddComponent, GetComponent] public Dummy dummy;
[AddComponent(typeof(BoxCollider)), GetComponent] public GameObject thisObj;
}
```

4.6. Third Party Tools

4.6.1. Addressable

These tools are for Unity Addressable. It's there only if you have Addressable installed.

Namespace: SaintsField.Addressable

If you encounter issue because of version incompatible with your installation, you can add a macro SAINTSFIELD_ADDRESSABLE_DISABLE to disable this component

4.6.1.1 AddressableLabel

A picker to select an addressable label.

• Allow Multiple: No

```
public class AddressableLabelExample : MonoBehaviour
{
    [AddressableLabel]
    public string addressableLabel;
}
```

4.6.1.2 AddressableAddress

A picker to select an addressable address (key).

- string group = null the Addressable group name. null for all groups
- params string[] orLabels the addressable label names to filter. Only entries with this label will be shown. null for no filter.

If it requires multiple labels, use A && B , then only entries with both labels will be shown.

If it requires any of the labels, just pass them separately, then entries with either label will be shown. For example, pass "A && B", "C" will show entries with both A and B label, or with C label.

Allow Multiple: No

```
public class AddressableAddressExample: MonoBehaviour
{
    [AddressableAddress] // from all group
    public string address;

    [AddressableAddress("Packed Assets")] // from this group
    public string addressInGroup;

    [AddressableAddress(null, "Label1", "Label2")] // either has label `Label1` or `Label2`
    public string addressLabel10r2;

    // must have both label `default` and `Label1`
    // or have both label `default` and `Label2`
    [AddressableAddress(null, "default && Label1", "default && Label2")]
    public string addressLabelAnd;
}
```

5. GroupBy

group with any decorator that has the same groupBy for this field. The same group will share even the width of the view width between them.

This only works for decorator draws above or below the field. The above drawer will not grouped with the below drawer, and vice versa.

"" means no group.

6. Common Pitfalls & Compatibility

List/Array & Nesting

Directly using on list/array will apply to every direct element of the list, this is a limit from Unity.

Unlike NaughtyAttributes, SaintsField does not need a AllowNesting attribute to work on nested element.

```
public class ArrayLabelExample : MonoBehaviour
{
    // works for list/array
    [Scene] public int[] myScenes;

    [System.Serializable]
    public struct MyStruct
    {
```

```
public bool enableFlag;

[AboveRichLabel("No need for `[AllowNesting]`, it just works")]
    public int integer;
}

public MyStruct myStruct;
}
```

Order Matters

SaintsField only uses PropertyDrawer to draw the field, and will properly fall back to the rest drawers if there is one. This works for both 3rd party drawer, your custom drawer, and Unity's default drawer.

However, Unity only allows decorators to be loaded from top to bottom, left to right. Any drawer that does not properly handle the fallback will override PropertyDrawer follows by. Thus, ensure SaintsField is always the first decorator.

An example of working with NaughtyAttributes:

```
public class CompatibilityNaAndDefault : MonoBehaviour
{
    [RichLabel("<color=green>+NA</color>"),
    NaughtyAttributes.CurveRange(0, 0, 1, 1, NaughtyAttributes.EColor.Green),
    NaughtyAttributes.Label(" ") // a little hack for label issue
    public AnimationCurve naCurve;
    [RichLabel("<color=green>+Native</color>"), Range(0, 5)]
    public float nativeRange;
    // this wont work. Please put `SaintsField` before other drawers
    [Range(0, 5), RichLabel("<color=green>+Native</color>")]
    public float nativeRangeHandled;
    // this wont work too. Please put `SaintsField` before other drawers
    [NaughtyAttributes.CurveRange(0, 0, 1, 1, NaughtyAttributes.EColor.Green)]
    [RichLabel("<color=green>+NA</color>")]
    public AnimationCurve naCurveHandled;
}
```

Multiple Fields Handling

Unlike NaghthyAttributes / Odin , SaintsField does not have a decorator like Tag , or GroupBox that puts several fields into one place because it does not inject a global CustomEditor .

For the same reason, it can not handle NonSerializedField and AutoPropertyField (unless you give a [field: SerializedFile] decorator to make it as a normal property). Because they are all not PropertyAttribute.

Other Drawers

SaintsField is designed to be compatible with other drawers if

1. the drawer itself respects the GUIContent argument in OnGUI

NOTE: NaughtyAttributes uses property.displayName instead of GUIContent . You need to set Label(" ") if you want to use RichLabel . Also, NaughtyAttributes tread many Attribute as first-class citizen, so the compatibility is not guaranteed.

2. if the drawer hijacks the CustomEditor , it must fall to the rest drawers

NOTE: In many cases odin does not fallback to the rest drawers, but only to odin and Unity's default drawers. So sometimes things will not work with odin

My (not full) test about compatibility:

- Markup-Attributes : Works very well.
- NaughtyAttributes: Works well, need that Label hack.
- OdinInspector: Works mostly well for MonoBehavior/ScriptableObject. Not so good for Odin's
 EditorWindow