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# **SlicerDevelopmentToolbox Documentation**

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**Feb 28, 2020**



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The SlicerDevelopmentToolbox is an Python API that simplifies the development of Slicer extensions. It consists of the following components:

- Mixins
- Helpers
- Widgets (QT)
- Buttons (QT)
- Icons (QT)
- Constants (DICOM, QT, CSS)
- Decorators
- Events (VTK)
- Exceptions
- Metaclasses



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## SlicerDevelopmentToolboxUtils package

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### 1.1 Subpackages

#### 1.1.1 SlicerDevelopmentToolboxUtils.module package

##### Submodules

SlicerDevelopmentToolboxUtils.module.base module

SlicerDevelopmentToolboxUtils.module.logic module

SlicerDevelopmentToolboxUtils.module.plugin module

SlicerDevelopmentToolboxUtils.module.session module

SlicerDevelopmentToolboxUtils.module.step module

##### Module contents

### 1.2 SlicerDevelopmentToolboxUtils.buttons module

### 1.3 SlicerDevelopmentToolboxUtils.constants module

```
class SlicerDevelopmentToolboxUtils.constants.COLOR
```

```
    GRAY
```

```
    GREEN
```

```
    RED
```

YELLOW

```
class SlicerDevelopmentToolboxUtils.constants.DICOMTAGS
```

```
    ACQUISITION_TIME = '0008,0032'  
    INSTANCE_NUMBER = '0020,0013'  
    PATIENT_BIRTH_DATE = '0010,0030'  
    PATIENT_ID = '0010,0020'  
    PATIENT_NAME = '0010,0010'  
    SERIES_DESCRIPTION = '0008,103E'  
    SERIES_NUMBER = '0020,0011'  
    STUDY_DATE = '0008,0020'  
    STUDY_ID = '0020,0010'  
    STUDY_TIME = '0008,0030'
```

```
class SlicerDevelopmentToolboxUtils.constants.FileExtension
```

```
    Bases: object
```

```
    FCSV = '.fcsv'  
    H5 = '.h5'  
    NRRD = '.nrrd'  
    TXT = '.TXT'  
    VTK = '.vtk'
```

```
class SlicerDevelopmentToolboxUtils.constants.STYLE
```

```
    GRAY_BACKGROUND = 'background-color: gray;'  
    GREEN_BACKGROUND = 'background-color: green;'  
    LIGHT_GRAY_BACKGROUND = 'background-color: rgb(230,230,230)'  
    ORANGE_BACKGROUND = 'background-color: rgb(255,102,0)'  
    RED_BACKGROUND = 'background-color: red;'  
    WHITE_BACKGROUND = 'background-color: rgb(255,255,255)'  
    YELLOW_BACKGROUND = 'background-color: yellow;'
```

## 1.4 SlicerDevelopmentToolboxUtils.decorators module

SlicerDevelopmentToolboxUtils.decorators.**beforeRunProcessEvent** (*func*)

Before running the decorated function slicer.app.processEvents() will be executed

SlicerDevelopmentToolboxUtils.decorators.**callCount** (*level=10*)

This decorator is useful for debugging purposes where one wants to know the call count of the decorated function.



**class** SlicerDevelopmentToolboxUtils.decorators.**classproperty** (*fget*)

Bases: object

This decorator enables adding properties to classes that can be called without instantiating an object

See Also: <https://stackoverflow.com/a/13624858>

**class** SlicerDevelopmentToolboxUtils.decorators.**logmethod** (*level=10*)

Bases: object

This decorator can be used for logging methods without the need of reimplementing log messages over and over again.

The decorator logs information about the called method name including caller and arguments.

```
from SlicerDevelopmentToolboxUtils.decorators import logmethod

@logmethod()
def sub(x,y, switch=False):
    return x -y if not switch else y-x

@logmethod(level=logging.INFO)
def sub(x,y, switch=False):
    return x -y if not switch else y-x
```

SlicerDevelopmentToolboxUtils.decorators.**onExceptionReturnFalse** (*func*)

Whenever an exception occurs within the decorated function, this decorator will return False

```
>>> from SlicerDevelopmentToolboxUtils.decorators import onExceptionReturnFalse
>>> @onExceptionReturnFalse
... def getElement(key, dictionary):
...     return dictionary[key]

>>> result = getElement('foobar', {'foo':1, 'bar':2}) # no foobar in dictionary
>>> result is False
```

SlicerDevelopmentToolboxUtils.decorators.**onExceptionReturnNone** (*func*)

Whenever an exception occurs within the decorated function, this decorator will return None

```
from SlicerDevelopmentToolboxUtils.decorators import onExceptionReturnNone
@onExceptionReturnNone
def getElement(key, dictionary):
    return dictionary[key]

result = getElement('foobar', {'foo':1, 'bar':2}) # no foobar in dictionary
```

**class** SlicerDevelopmentToolboxUtils.decorators.**onModuleSelected** (*moduleName*)

Bases: object

This decorator can be used for executing the decorated function/method only if a certain Slicer module with name `moduleName` is currently selected

```
from SlicerDevelopmentToolboxUtils.decorators import onModuleSelected

@onModuleSelected(moduleName="SliceTracker")
def onLayoutChanged(self, layout=None):
    print("layout changed")
```

SlicerDevelopmentToolboxUtils.decorators.**onReturnProcessEvent**s (*func*)

After running the decorated function `slicer.app.processEvents()` will be executed

`SlicerDevelopmentToolboxUtils.decorators.postCall` (*functionToCall*)

This decorator calls `functionToCall` after the decorated function.

**Parameters** `functionToCall` (*function*) – function to be called after the decorated function

`SlicerDevelopmentToolboxUtils.decorators.priorCall` (*functionToCall*)

This decorator calls `functionToCall` prior to the decorated function.

**Parameters** `functionToCall` (*function*) – function to be called prior(before) the decorated function

**class** `SlicerDevelopmentToolboxUtils.decorators.processEventsEvery` (*interval=100*)

Decorator for executing a method/function every `n` milli seconds.

`onTriggered` ()

`SlicerDevelopmentToolboxUtils.decorators.singleton` (*cls*)

This decorator makes sure that only one instance of the decorated class will be created (singleton).

See Also: <http://stackoverflow.com/questions/12305142/issue-with-singleton-python-call-two-times-init>

`SlicerDevelopmentToolboxUtils.decorators.timer` (*func*)

This decorator can be used for profiling a method/function by printing the elapsed time after execution.

## 1.5 SlicerDevelopmentToolboxUtils.events module

**class** `SlicerDevelopmentToolboxUtils.events.SlicerDevelopmentToolboxEvents`

Bases: `object`

`CanceledEvent`

`FailedEvent`

`FileCountChangedEvent`

`FinishedEvent`

`NewFileIndexedEvent`

`NewImageDataReceivedEvent`

`SkippedEvent`

`StartedEvent`

`StatusChangedEvent`

`StoppedEvent`

`SuccessEvent`

## 1.6 SlicerDevelopmentToolboxUtils.exceptions module

**exception** `SlicerDevelopmentToolboxUtils.exceptions.DICOMValueError`

Bases: `exceptions.ValueError`

**exception** `SlicerDevelopmentToolboxUtils.exceptions.NoEligibleSeriesFoundError`

Bases: `exceptions.ValueError`

**exception** `SlicerDevelopmentToolboxUtils.exceptions.PreProcessedDataError`

Bases: `exceptions.ValueError`

**exception** SlicerDevelopmentToolboxUtils.exceptions.**UnknownSeriesError**  
Bases: exceptions.ValueError

## 1.7 SlicerDevelopmentToolboxUtils.helpers module

## 1.8 SlicerDevelopmentToolboxUtils.icons module

## 1.9 SlicerDevelopmentToolboxUtils.metaclasses module

**class** SlicerDevelopmentToolboxUtils.metaclasses.**Singleton**  
Bases: type

## 1.10 SlicerDevelopmentToolboxUtils.mixins module

## 1.11 SlicerDevelopmentToolboxUtils.widgets module

## 1.12 Module contents



For more information, please see:

<http://www.slicer.org>

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